

Ft. Gordon Range Control Center  
BLDG. 482  
N. Range Road  
Ft. Gordon, GA 30905

## RANGE 6

M16A2, RETS Range

Standing Operating Procedures (SOP)

1 JAN 02

## **RANGE 6**

### **Administrative Procedures**

**Physical Location:** Range 6 is physically located on N. Range Road. It is located at the intersection of N. Range Road and Gibson Rd.

**Grid location:** LG 85729385

**Type of Range:** Range 6 is primarily used for:  
(1) Computerized **RETS** Range Qualification

### **Types of Weapon & Ammunition Authorized:**

#### **Weapons:**

- a. M16A1
- b. M16A2
- c. M4 Carbine

#### **Ammunition:**

- a. 5.56mm Ball only

**Scheduling Range:** This range is scheduled through the Range Facility Management Support System (RFMSS). Scheduling office is located at BLDG. #482 Range Control Headquarters. Telephone #706-791-9936/5008. DSN: 780-9936/5008. All ranges are scheduled by your S3 utilizing a RFMSS unit customer account. Non-account users may schedule via memorandum signed by units Battalion Commander, or representative.

**Classroom (RTC Building):** The RTC Building must be requested during the request of the range through the **RFMSS** scheduling system.

## **RANGE 6**

**OIC/RSO/MEDIC Range Check-in procedures:** OIC/RSO/MEDIC will show up at Range Control at the same time to sign for the range. They will provide the following documents upon arrival at Range Control:

**OIC:** Current Range certification card

**RSO:** Current Range certification card

**MEDIC:** Current Medical certification CLS(Combat Life Saver) or higher and Medical Aid bag.

**Day of Range:** OIC/RSO/MEDIC will arrive together to sign for the range. (Without these three and the proper documents the range will not be signed out)

**Range Firing Hours:** 0730-1630

**Range Availability:** Range 6 is available seven days a week. Weekend firing and extended range hours, must be requested during the **RFMSS** scheduling phase. If you need to go past **1630** to complete your firing, request permission as soon as possible.

**Other Training Activities:** **NO other training is authorized on the range.**

**Radio Communications:** Singar radio's will be the primary means of comms if training unit has them. You will receive two Motorola radios when you sign for the range. Radios must be used on Channel 1 and used only for communications with Range Control.

- a. Request "hot" time
- b. Make hourly radio checks every hour on the hour
- c. Immediately "cease fire" anytime there is a problem on the range and contact Range Control.
- d. Continuously monitor Range Control frequency
- e. Request "cold" time
- f. Request Range Control to come out and clear you off the Range
- g. **Use of the Radios for anything other than communicating with Range Control is strictly forbidden.**

## **RANGE 6**

**Range Control Provides:**

- a. PA system (located in the range tower).
- b. Red & White safety paddles for each line safety (5 located in the range tower).
- c. Metal rods for rodding soldiers on and off the range and firing line (5 located in the range tower).
- d. Ammunition Point building.

- e. Range Tower (only 3 people allowed in the tower at a time).
- f. Range SOP, and briefing on range tower operation.

**Unit Provides:**

- a. Two (2) 1-A:10B:C [dry chemical] fire extinguisher.
- b. Combat lifesaver, dedicated emergency vehicle and medical aid bag.
- c. Plastic trash bags, toilet paper
- d. Hearing protection.
- e. Drinking water.
- f. TM and FM on all weapon systems being fired.
- g. AR 385-63, Range & Training Safety
- h. White method for designating safety personnel

**RECORD FIRE SCORECARDS:** The range computer is operated by a designated unit soldier who will be briefed on the operation of the computer prior to the range going hot. The computer operator will print out a score sheet of the firing orders scores.

## **RANGE 6**

**Ricochet Hazard:** It is of paramount importance that only authorized weapon systems, ammunition and target placement are utilized on this range.

**Target Placement:** Range Control personnel are the only ones authorized to proceed beyond the firing line on this range.

**Firing Positions Authorized:**

- a. Prone
- b. Prone Supported (sand bags)
- c. Fighting hole

**Courses of Fire Authorized:** The following courses of fire are authorized:

**- M16/ M4-**

RETS qualification course,  
**FM-23-9**

**Night**

**Fire:** Night firing is no longer authorized on Range 6.

**Feedback Targets:**

**Other Uses:** No other uses authorized.

**Pyrotechnics Use:** Pyrotechnics are not authorized for use on the range.

## **RANGE 6**

**Special Range Planning Assistance:** Special range planning assistance is available from the Range Control staff. We will assist you in every way that we can to help make your training experience safe, realistic and effective. Pay us a visit - let's discuss your ideas.

### **Basic Weapons Safety Procedures**

The following basic weapons safety procedures will be observed:

- a. When arriving and departing the range.
- b. When arriving and departing the firing line.
- c. While weapons are stacked with a guard posted within arms reach.

**- M16, M4 -**

Magazine removed

Bolt locked to the rear  
Dust cover open  
Weapon on safe  
Barrel rodded

## **WEAPONS SAFETY BRIEFING**

It is the responsibility of the unit **OIC** to ensure that the **RSO** conducts a “basic weapons safety briefing” for all personnel, as a group, upon arrival at the range. Also, provide a briefing for all persons arriving after the initial briefing has been given.

**Concurrent Training/PMI Instruction:** Maybe conducted behind the firing line in a designated area. PMI (weapon drills, individual instruction, manipulation of weapons, aiming of weapons) will be supervised by an NCO and conducted in designated PMI areas only.

**Example (Dime/Washer Exercise)** Multi-purpose Arcade Combat Simulator Systems [**MACS**] are located in the RTC building.

## **RANGE 6**

**RTC Building:** Request the RTC building for use of the [**MACS**], is to be done through the RFMSS. Scheduling of the RTC building has the same requirements and time line as the ranges.

**Hearing Protection:** Appropriate hearing protection is required for all personnel, including workers and visitors, while within **50 meters** of the firing line.

**Tracer Ammunition:** No tracer ammunition will be used on this range. No exceptions.

## **Standard Targets Provided**

M16, M4 - Plastic silhouettes attached to electronic pop-up targetry
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**MEDEVAC Procedures:** For serious injury or illness the range OIC will contact Range Control @ 706-791-5005/5008 or by radio FM 42:000 to request Medical assistance from DDEAMC.

## **RANGE 6**

**Gate Guard Requirements:** From time-to-time unauthorized persons or visitors may attempt to gain access to the range. The gate guard will be posted at all times while the range is occupied to aid in preventing the unauthorized access. At no time will the gate guard attempt to stop **RANGE CONTROL** or any **EMERGENCY** vehicle from gaining access to the range.

**Environmental Considerations:** Vehicle refueling operations will not be conducted on this range. All tactical vehicles will have a drip pan under the vehicle when it is parked. If a spill occurs report it to Range Control immediately. Bring plastic trash bags; take your trash with you. Using unit must clean the latrine prior to departing the range.

**Pyrotechnics, Blanks, CS Gas:** At **no time** will pyrotechnics, blanks, or CS gas be used on the range.

**Sleeping on Range:** Sleeping on the range is not allowed. It is pertinent that all soldiers stay awake and alert to help maintain a safe environment on the range.

**Animals on Range:** Unit mascots, such as **dogs**, are not allowed on the range.

**End of Firing Comments:** We encourage all **OICs** and **RSOs** to make constructive written comments on the second page of their **Range Checklist** at the completion of firing. Your input is valuable to this operation. Help us improve “your” range.

**Range Safety Violations:** It is not our intent to “find things wrong” with your range but rather to reduce and mitigate hazardous unsafe conditions. **OICs** and **RSOs** operating in an unsafe manner will cause their range to be closed - with the possibility of being decertified. All range safety violations will be forwarded to your higher headquarters and to the Garrison Commander through DPTM.

## **RANGE 6**

**What Does Unsafe Mean:** This can be explained quite simply: Operating your range in a manner that creates a dangerous situation for others; operating outside of weapons safety standards set forth in AR 385-63, USASC&FG Reg 210-21 this SOP and other applicable FM and TM guidelines.

**OIC/RSO/NCOIC Duties:** General duties of the unit **OIC**, **RSO**, and **NCOIC**. **See AR 385-63**.

**OIC Duties:** The **OIC** [**E7 or above**] is responsible for activities that take place on all areas of the range not just the firing line. The **OIC** will stay on the range at all times.

**RSO Duties:** The **RSO** [**E6 or above**] is specifically responsible for weapons safety on all portions of the range.

**Line Safety NCO's:** [**E4(CPL) and above**] safety duties:

- (1) Assist the **RSO** with firing line safety procedures.
- (2) Observe and mitigate unsafe conditions on the firing line.
- (3) Utilize red and white safety paddles for command and control.
- (4) Rodding weapons on/off the range and firing line.
- (5) Weapons safety checks.
- (6) Bleacher safety.
- (7) Providing safety related assistance for soldiers.



**NCOIC:** normally runs the range tower by announcing fire commands and taking directions from the **OIC**.

**Red Ammunition Amnesty Box:** Located in the motor pool at Range Control Headquarters.

This box is not intended for unit trash, brass or ammunition that is to be turned back into the ASP.

## **RANGE 6**

**Munitions Amnesty Turn in Policy:** Explosive Ordinance disposal support will be arranged by Range Control. Contact Range Control fire desk at 706-791-5005/5008 or by radio FM 42000. If you can not contact Range Control, call the MP desk at 706-791-4380.

RAMDEO RAMTAHAL  
MSG, USA  
OIC, Range Control

## **RANGE 6**

### Appendix A

#### **Duties of the OIC**

1. Range 6 is not a difficult range to supervise or operate. Range Control staff will provide hands-on training and advice. The OIC operates and runs the range. The RSO supervises all activities on the firing line.

#### **Initial check-in procedures:**

- a. Before coming to Range Control check with your company training NCO/battalion S3 to ensure that your unit has been scheduled for Range 6.
- b. Check-in at Fort Gordon Range Control Headquarters no earlier than 0700 on the day of the range.
- c. Read Range SOP and sign for all equipment needed for the operation of the range.

#### **Day of the Range:**

- a. On the scheduled date go directly to the Range Control Headquarters and check-in with the range cadre.
- b. Range Control Cadre will provide you with a range tower briefing, which will cover range safety, tower operation, and scoring.
- c. Ensure that your radio operator conducts radio checks every hour on the hour (after you receive a hot time) and monitor Range Control frequency at all times.
- d. Set up your range tower operation and ensure that the tower NCOIC is familiar with fire commands and qualification procedures.

- e. Follow weapon qualification scoring procedures outlined in FM 23-9.
- f. Ensure that the RSO provides a range safety briefing for all soldiers that occupy the range.
- g. Request a “hot” time from Range Control. Notify Range Control anytime you “cease fire”, and request a “cold” time once firing has been completed.

## RANGE 6

### **Duties of the RSO**

1. The primary duties of the Range Safety Officer (RSO) are outlined in AR 385-63, Chapter 4, and this SOP. Primarily the RSO assists the OIC in maintaining and enforcing range safety standards not just on the firing line but all portions of the range.

## Appendix B

### **Road Guard Location & Duties**

**Road Guard Duties:** One road guard post is located at the main entrance to the range. Road guard duties:

- a. Stop unauthorized military and civilian personnel from entering the range.
- b. Instruct all visitors to report to Range Control Headquarters.
- c. **Do Not** delay or attempt to stop Range Control Cadre personnel from entering the range – vehicles are clearly marked.

# *Lightning Safety*



Signal Branch Safety Office

(706) 791-7233

# *Lightning Facts*

2<sup>nd</sup> Leading Cause of Weather Deaths in the United States

**Kills more than Hurricanes and  
Tornadoes combined!**

- **Kills ~ 100 / Year**
- **Kills ~ 10% of those  
Struck**



# *Lightning Facts*

**Survivors are an even greater tragedy!**

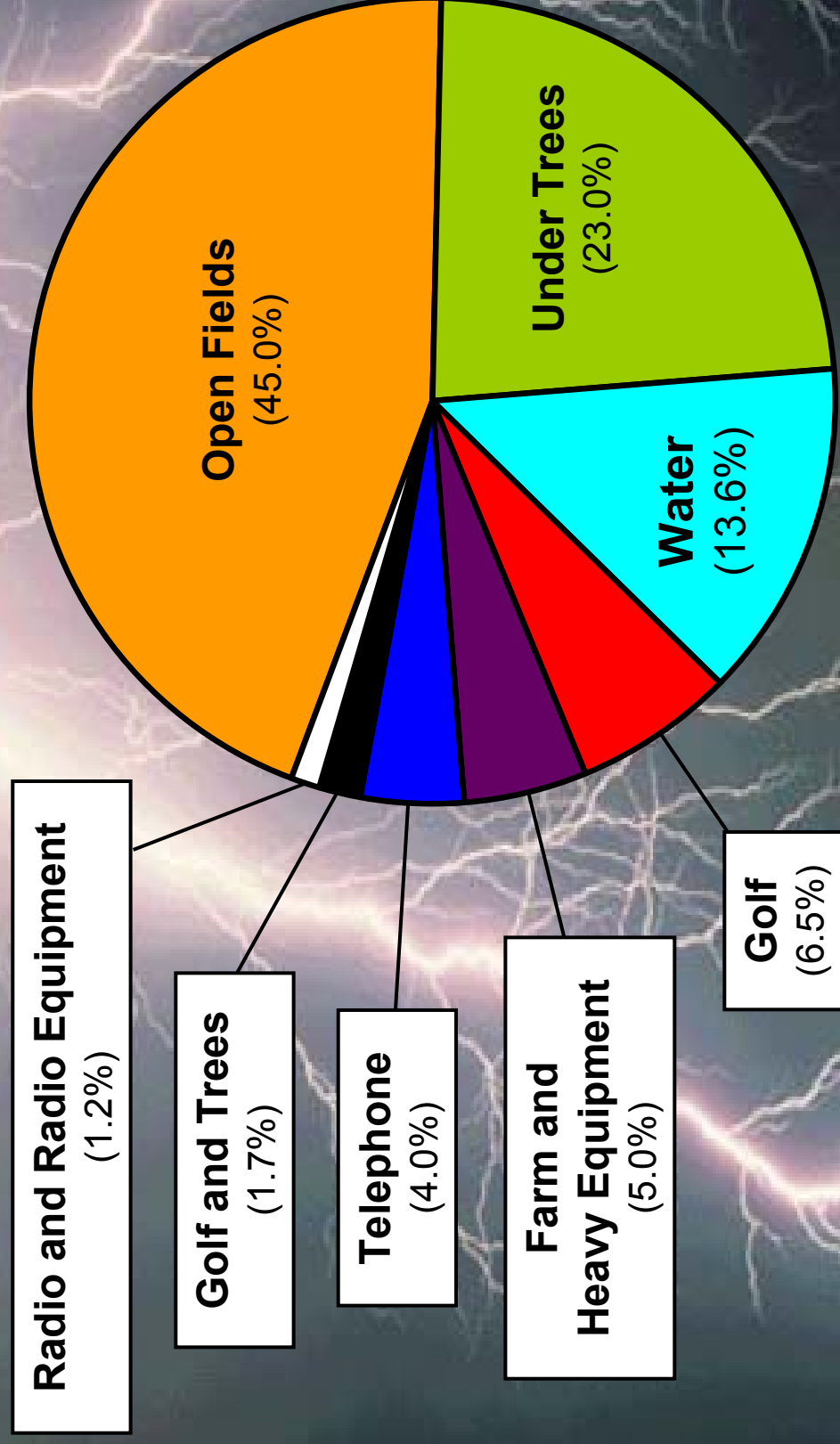
- **Injures ~750 / Year**
- **~ 70% Long-Term Medical Problems**
- **~ 30% Suffer Debilitating Problems**
- **Elusive Data**
  - **40 - 70% Under-Reported**



Courtesy of National Lightning Safety Institute

# *Lightning Facts*

**When thunderstorms nearby, avoid these activities  
like your life depends on it -- It Does!**



**Lightning Casualties In U.S. (1959-1994)**

# *Lightning Safety when Outdoors*

If you can see lightning or hear thunder, activate your safety plan. Resume activities only when lightning and thunder have not been observed for thirty minutes.

***If you can see it (lightning), flee it;  
if you can hear it (thunder), clear  
it.***



# *Lightning Safety*

- “30 / 30 Rule”
- If 30 Secs Or Less “Flash To Bang” - Seek Shelter

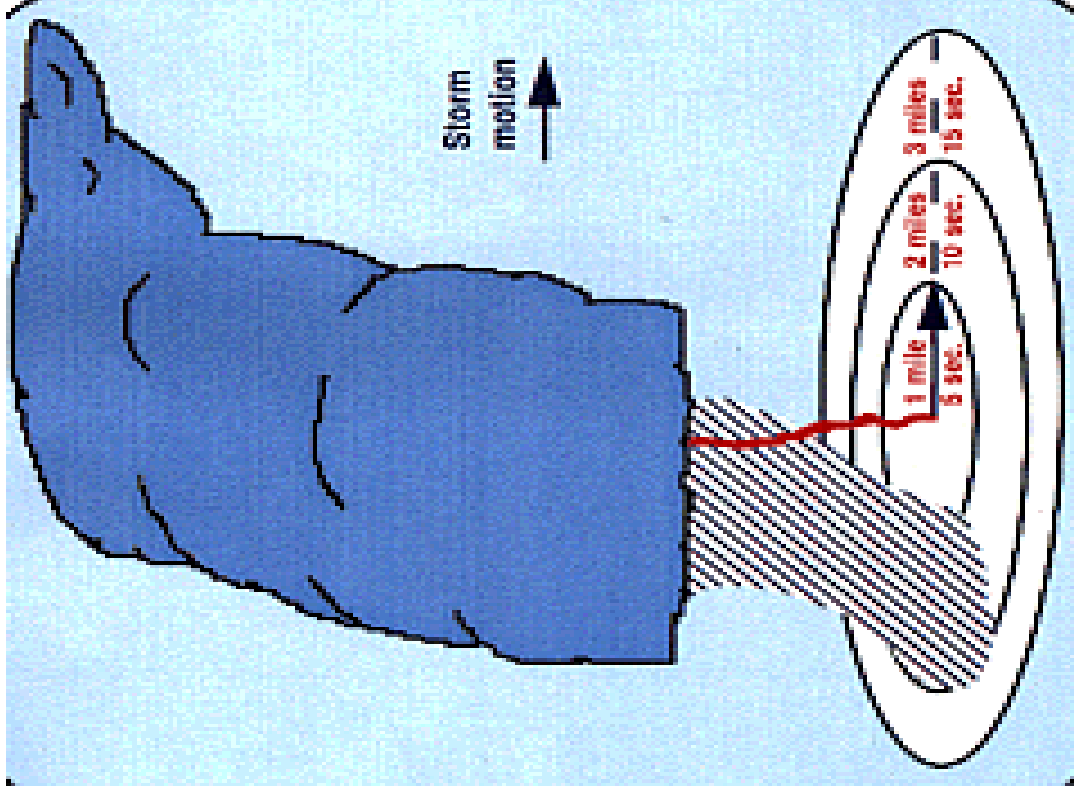
## COMMON MISCONCEPTION

1 second = 1 mile

## ACTUALLY

**5 seconds = 1 mile**

- Wait 30 Min After Last Lightning, Before Leaving Shelter
- May Seem Too Conservative--  
It's NOT!



# *Lightning Safety*



- Important Components Of A Dispersal/Safety Plan
  - Designated individual responsible to monitor the weather and initiate the necessary precautions when appropriate.
  - Procedure identified to notify all personnel of the appropriate actions when there is a threat or risk of lightning.
  - Safer locations must be pre-identified along with a means to route personnel to those locations.
  - Establishment of an “All Clear” signal which is differentiated from the warning signal.
  - Periodically [Review / Train / Drill Dispersal Plan](#)

# Associated Hazards

Contrary to common belief, most lightning accidents do not come from direct lightning strikes. There are several ways lightning can cause injury.

## COMMUNICATION



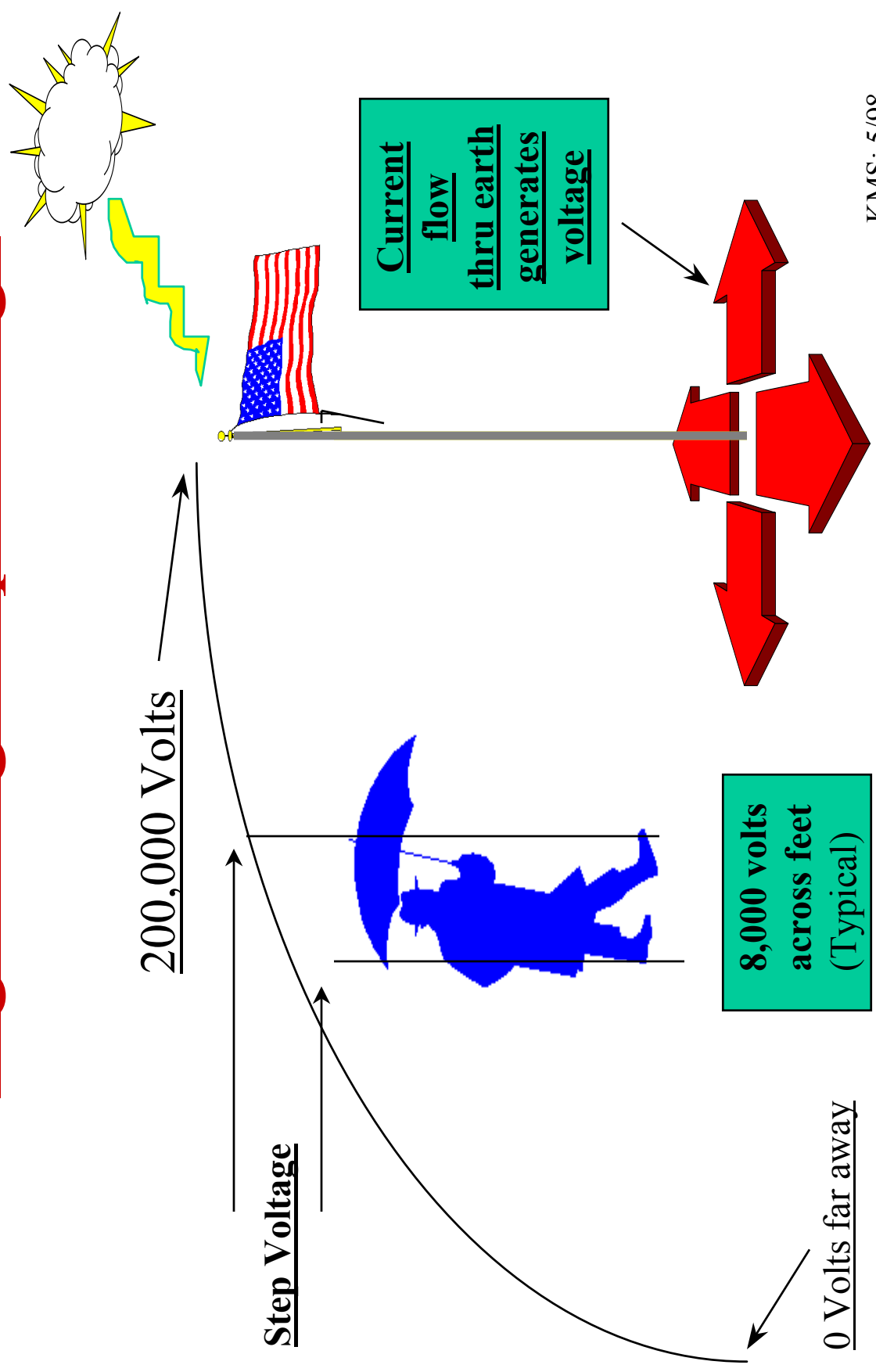
# Tactical Communication

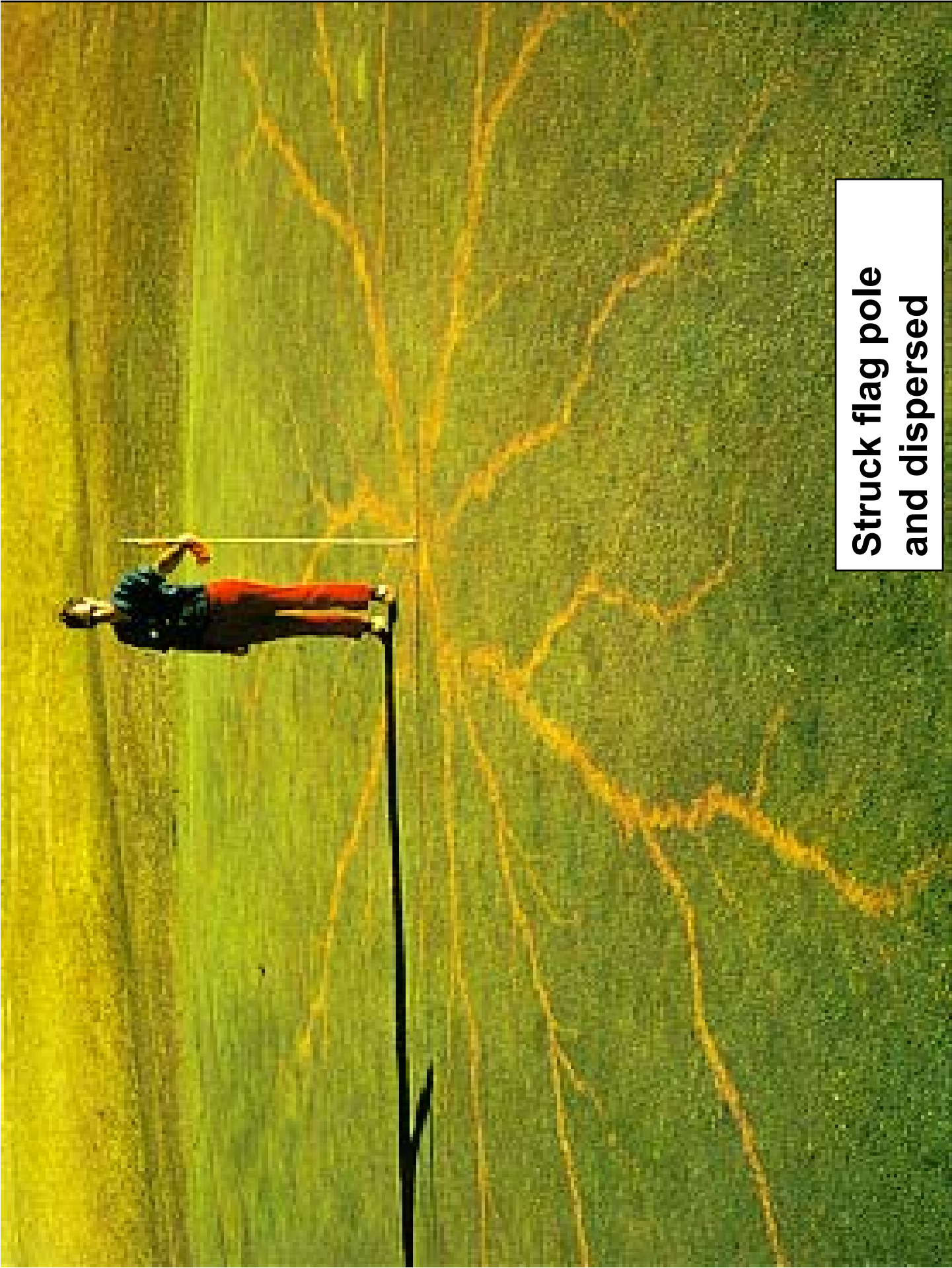
- Equipment will be grounded IAW grounding instructions contained in applicable TMs. Remember that soil type impacts the grounding.
- Keep away from antennas, masts, guy wires and all grounding and lightning protection equipment, including ground rods, during electrical storm activity. This includes vehicles with whip antennas.

# Tactical Communication

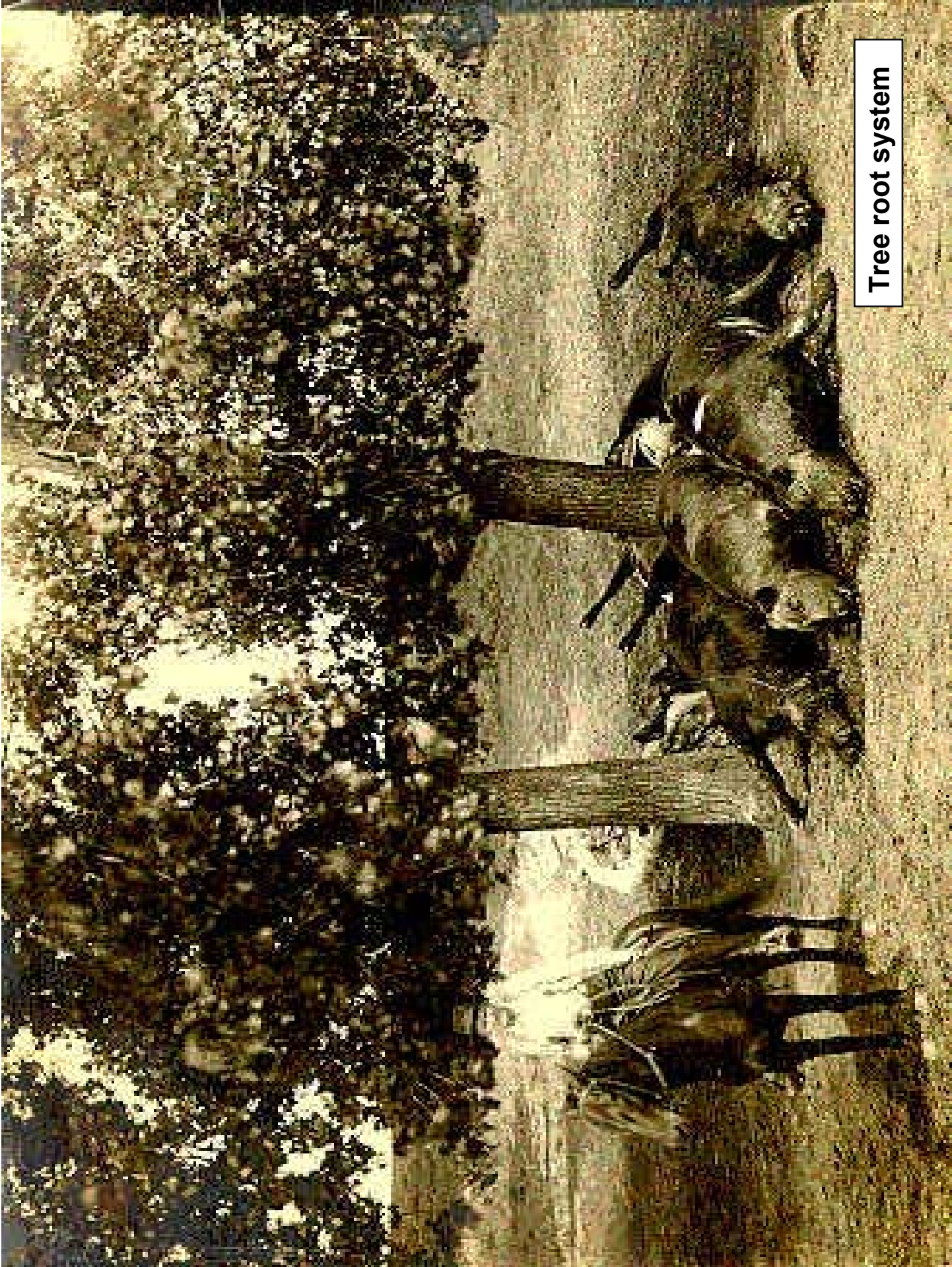
- If mission permits, disconnect the signal inputs before the storm. Do not attempt this during the storm, even if lightning is not nearby!
- Restrict the use of telephones, computers and other electrical devices. Lightning could follow the wire. Most lightning injuries occur from using phones during electrical storms.
- Radios will not be used, nor will troops carry radios with antennas extended.

# Lightning Step Voltage





**Struck flag pole  
and dispersed**



Tree root system

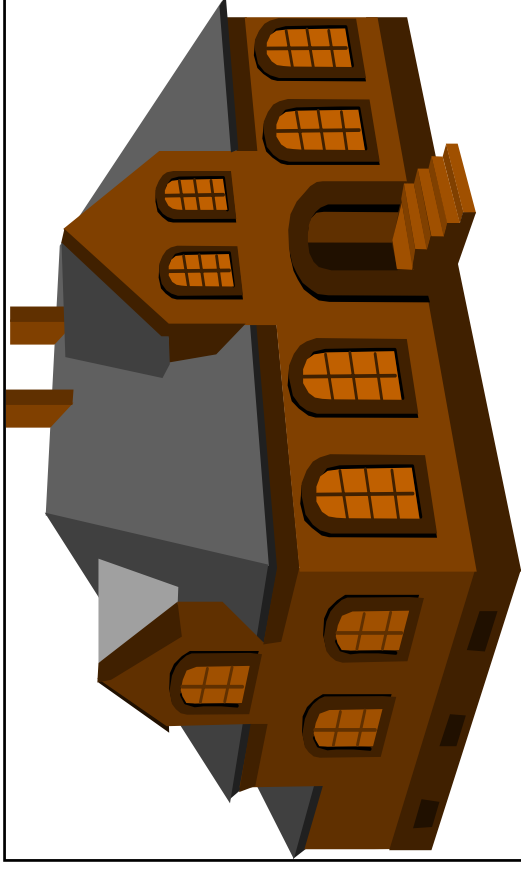


# Safe Locations #1

- No place is absolutely safe from lightning. Ideally, evacuation to a lightning certified or lightning protected building is the best when available; however, this will probably not be the case.

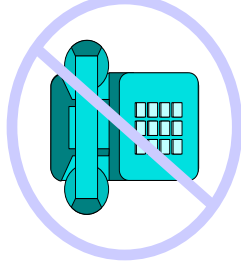
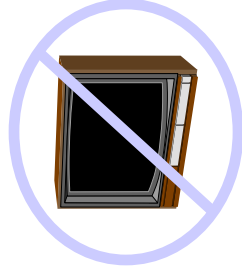
THEN

- Large enclosed structures (substantially constructed buildings).

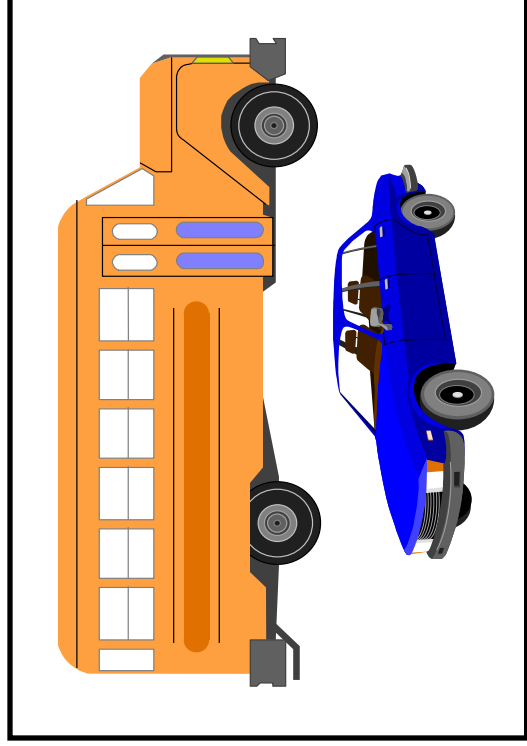


# Indoor Lightning Safety

- Avoid using telephone (remember the wires).
- Avoid using water – sink, tub, etc. (plumbing)
- Unplug appliances (remember the wires).
- Inner rooms the best



# Safe Locations #2



- Fully enclosed metal vehicles – car, bus, etc.
  - Close windows
  - Keep hands on lap

It's not the rubber tires that make a vehicle safe – it's the metal enclosure.

**Not** Canvas Type (soft) Tops

# Safe Locations #3

- Remaining Outdoors
  - Stay away from rivers, lakes, or other bodies of water. Be aware of the potential for flooding in low-lying areas.
  - Stay away from natural lightning rods/tall structures such as: towers, tall trees, telephone poles/lines, tents with metal supports, etc.
  - Take shelter under a small tree among several large ones if possible. Stay at least six feet away from the tree trunk to minimize a side strike and step voltage. NEVER stand under an isolated tree.

## Safe Locations #3 (con't)

- Stay low (crouch) in a ditch or depression. Other options include a low area, ravine, or foot of a hill. **DO NOT** lie flat on ground.
- Weapons should be stacked at least 50 meters away from personnel.
- Miles gear and other metal conductors should be removed.

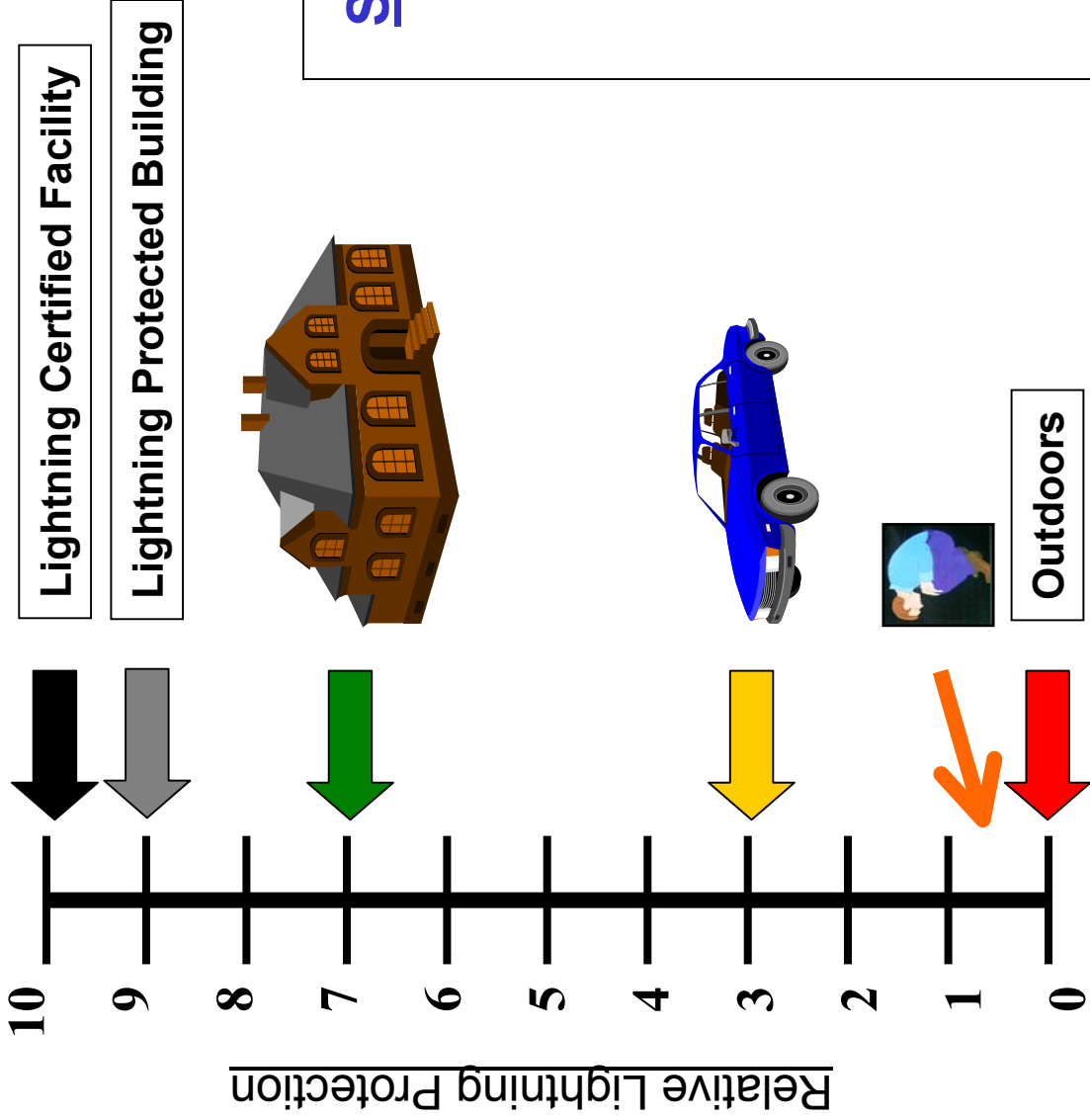
# Lightning Safety Position (LSP)

- Assume LSP.
  - Crouch with feet as close together as possible.
  - Have heels touch.
  - Place hands over ears.

**-REMEMBER-  
DO NOT LIE FLAT  
ON THE GROUND**



# Lightning Safe Locations



## Seek Proper Shelter

- Buildings Much Better Than Vehicles
  - Large, Fully Enclosed, Substantially Built
- Vehicles Offer Some Safety
- No Place Outside Is Safe Near A Thunderstorm
  - Near  $\equiv$  6 Miles

# Lightning Safety Websites

- 45<sup>th</sup> Weather Squadron Lightning Safety Website:  
<http://www.patrick.af.mil/45og/45ws/LightningSafety/index.htm>
- NOAA Lightning Safety:  
<http://www.lightningsafety.noaa.gov/>
- CECOM Publications (Antenna Safety, Grounding, etc.)  
<http://www.monmouth.army.mil/cecom/safety/SYSTEM/SPUB.HTM>
- Kids' Lightning Information and Safety:  
<http://www.azstarnet.com/anubis/zaphome.htm>



## CHECKLIST FOR THE COACH

The procedures to determine and eliminate rifle and firer deficiencies follows.

*The coach checks to see that the--*

- Rifle is cleared and defective parts have been replaced.
- Ammunition is clean, and the magazine is properly placed in the pouch.
- Sights are blackened and set correctly for long/short range.

*The coach observes the firer to see that he--*

- Uses the correct position and properly applies the steady-position elements.
- Properly loads the rifle.
- Obtains the correct sight alignment (with the aid of an M16 sighting device).
- Holds his breath correctly (by watching his back at times).
- Applies proper trigger squeeze; determines whether he flinches or jerks by watching his head, shoulders, trigger finger, and firing hand and arm.
- Is tense and nervous. If the firer is nervous, the coach has the firer breathe deeply several times to relax.

Supervisory personnel and peer coaches correct errors as they are detected. If many common errors are observed, it is appropriate to call the group together for more discussion and demonstration of proper procedures and to provide feedback.

## POSITION OF THE COACH

The coach constantly checks and assists the firer *in applying marksmanship* fundamentals during firing. He observes the firer's position and his application of the steady position elements. The coach is valuable in checking factors the firer is unable to observe for himself and in preventing the firer from repeating errors.

During an exercise, the coach should be positioned where he can best observe the firer when he assumes position. He then moves to various points around the firer (sides and rear) to check the correctness of the firer's position. The coach requires the firer to make adjustments until the firer obtains a correct position.

When the coach is satisfied with the firing position, he assumes a coaching position alongside the firer. The coach usually assumes a position like that of the firer, which is on the firing side of the soldier.

## GROUPING

Shot grouping is a form of practice firing with two primary objectives: firing tight shot groups and consistently placing those groups in the same location. Shot grouping should be conducted between dry-fire training and zeroing. The initial live-fire training should be a grouping exercise with the purpose of practicing and refining marksmanship fundamentals. Since this is not a zeroing exercise, few sight changes are made. Grouping exercises can be conducted on a live-fire range that provides precise location of bullet hits and misses such as a 25-meter zeroing range or KD range.

## CONCEPT OF ZEROING

The purpose of battle sight zeroing is to align the **fire control system** (sights) with the rifle barrel, considering the given ammunition ballistics. When this is accomplished **correctly**, the fire control and point of aim are point of impact at a **standard battlesight zero range** such as 250 (300) meters.

When a rifle is zeroed, the sights are adjusted so that bullet strike is the same as point of aim at some given range. A battlesight zero (250 meters, M16A1; 300 meters, M16A2) is the sight setting that provides the highest hit probability for most combat targets with minimum adjustment to the aiming point.

When standard zeroing procedures are followed, a rifle that is properly zeroed for one soldier is close to the zero for another soldier. When a straight line is drawn from target center to the tip of the front sight post and through the center of the rear aperture, it makes little difference whose eye is looking along this line. There are many subtle factors that result in differences among individual zeros; however, the similarity of individual zeros should be emphasized instead of the differences.

Most firers can fire with the same zeroed rifle if they are properly applying marksmanship fundamentals. If a soldier is having difficulty zeroing and the problem cannot be diagnosed, having a good firer zero the rifle could find the problem. When a soldier must fire another soldier's rifle without opportunity to verify the zero by firing - for

example, picking up another man's rifle on the battlefield - it is closer to actual zero if the rifle sights are left unchanged. This information is useful in deciding initial sight settings and recording of zeros. All rifles in the arms room, even those not assigned, should have their sights aligned (zeroed) for battlesight zero.

There is no relationship between the specific sight setting a soldier uses on one rifle (his zero) to the sight setting he needs on another rifle. For example, a soldier could be required to move the rear sight of his assigned rifle 10 clicks left of center for zero, and the next rifle he is assigned could be adjusted 10 clicks right of center for zero. This is due to the inherent variability from rifle to rifle, which makes it essential that each soldier is assigned a permanent rifle on which all marksmanship training is conducted. Therefore, all newly assigned personnel should be required to fire their rifle for zero as soon as possible after assignment to the unit. The same rule must apply anytime a soldier is assigned a new rifle, a rifle is returned from DS or GS maintenance, or the zero is in question.

## **M16A1 STANDARD SIGHTS AND ZEROING**

To battlesight zero the rifle, the soldier must understand sight adjustment procedures. The best possible zero is obtained by zeroing at actual range. Because facilities normally do not exist for zeroing at 250 meters, most zeroing is conducted at 25 meters. By pushing the rear sight forward so the L is exposed, the bullet crosses line of sight at 25 meters, reaches a maximum height above line of sight of about 11 inches at 225 meters, and crosses line of sight again at 375 meters.

To gain the many benefits associated with having bullets hit exactly where the rifle is aimed during 25-meter firing, the long-range sight is used on the zero range. Therefore, when bullets are adjusted to hit the same place the rifle is aimed at 25 meters, the bullet also hits where the rifle is aimed at 375 meters. After making this adjustment and flipping back to the short-range sight and aiming center of mass at a 42-meter target, the bullet crosses the line of sight at 42 meters and again at 250 meters as shown in.

Most combat targets are expected to be engaged in the ranges from 0 to 300 meters; therefore, the 250-meter battlesight zero is the setting that remains on the rifle. At 25 meters, the bullet is about 1 inch below line of sight, crossing line of sight at 42 meters. It reaches its highest point above the line of sight (about 5 inches) at a range of about 175 meters, crosses line of sight again at 250 meters, and is about 7 inches below line of sight at 300 meters. Targets can be hit out to a range of 300 meters **with** no adjustments to point of aim. (A somewhat higher hit probability results with minor adjustments to the aiming point.)

**Sights.** The sights are adjustable for both elevation and windage. Windage adjustments are made on the rear sight; elevation adjustments on the front sight.

*Rear sight.* The Rear sight consists of two apertures and a windage drum with a spring-loaded detent. The aperture marked L is used for ranges beyond 300 meters, and the unmarked or short-range aperture is used for ranges up to 300 meters. Pressing in on the spring-loaded detent with a sharp instrument (or the tip of a cartridge) and rotating the windage drum in the desired direction of change (right or left) in the strike of the bullet makes adjustments for windage.

*Front sight.* The front sight consists of a round rotating sight post with a five-position, spring-loaded detent. Adjustments are made by using a sharp instrument (or the tip of a cartridge). To move the front sight post, the spring-loaded detent is depressed, and the post is rotated in the desired direction of change (up or down) in the strike of the bullet.

**Sight Changes,** To make sight changes, the firer first locates the center of his three-round shot group and then determines the distance between it and the desired location. An error in elevation is measured vertically, while a windage error is measured horizontally. When using standard zero targets or downrange feedback targets, sight adjustment guidance on the target is provided.

To raise the strike of the bullet, the firer rotates the front sight post the desired number of clicks clockwise (in the direction of the arrow marked UP in. Thus, the strike of the bullet is raised but the post is lowered. He reverses the direction of rotation to move the strike of the bullet down.

To move the strike of the bullet to the right, the windage drum is rotated the desired number of clicks clockwise (in the direction of the arrow marked R,. The firer reverses the direction of rotation to move the strike of the bullet to the left.

**NOTE:** Before making any sight changes, the firer should make a serviceability check of the sights, looking for any bent, broken, or loose parts. The firer must also be able to consistently fire 4-cm shot groups.

## **M16A2 STANDARD SIGHTS AND ZEROING**

When the soldier can consistently place three rounds within a 4-cm circle at 25 meters, regardless of group location, he is ready to zero his rifle.

The front and rear sights are set as follows:

**Rear sight.** The rear sight consists of two sight apertures, a windage knob, and an elevation knob.

The larger aperture, marked 0-2, is used for moving target engagement and during limited visibility. The unmarked aperture is used for normal firing situations, zeroing, and with the elevation knob for target distances up to 800 meters. The unmarked aperture is used to establish the battlesight zero.

After the elevation knob is set, adjustments for elevation are made by moving the front sight post up or down to complete zeroing the rifle. Adjustments for windage are made by turning the windage knob.

The rear windage knob start point is when the index mark on the 0-2 sight is aligned with the rear sight base index.

**Front sight.** The front sight is adjusted the same as the front sight of the M16A1. It consists of a square, rotating sight post with a four-position, spring-loaded detent. Adjustments are made by using a sharp instrument or the tip of a cartridge. To raise or lower the front sight post, the spring-loaded detent is depressed, and the post is rotated in the desired direction of change.

## FIRING POSITIONS

All firing positions are taught during basic rifle marksmanship training. During initial fundamental training, the basic firing positions are used. The other positions are added later in training to support tactical conditions.

**Basic Firing Positions.** Two firing positions are used during initial fundamental training: the individual supported fighting position and prone unsupported position. Both offer a stable platform for firing the rifle. They are also the positions used during basic record fire.

*Supported fighting position.* This position provides the most stable platform for engaging targets. Upon entering the position, the soldier adds or removes dirt, sandbags, or other supports to adjust for his height. He then faces the target, executes a half-face to his firing side, and leans forward until his chest is against the firing-hand corner of the position. He places the rifle handguard in a V formed by the thumb and fingers of his nonfiring hand, and rests the nonfiring hand on the material (sandbags or berm) to the front of the position. The soldier places the stock butt in the pocket of his firing shoulder and rests his firing elbow on the ground outside the position. (When prepared positions are not available, the prone supported position can be substituted.)

Once the supported fighting position has been mastered, the firer should practice various unsupported positions to obtain the smallest possible wobble area during final aiming and hammer fall. The coach/trainer can check the steadiness of the position by observing movement at the forward part of the rifle, by looking through the M16 sighting device, or by checking to see that support is being used.

**NOTE:** The objective is to establish a steady position under various conditions. The ultimate performance of this task is in a combat environment. Although the firer must be positioned high enough to observe all targets, he must remain as low as possible to provide added protection from enemy fire.

*Prone unsupported position.* This firing position offers another stable firing platform for engaging targets. To assume this position, the soldier faces his target, spreads his feet a comfortable distance apart, and drops to his knees. Using the butt of the rifle as a pivot, the firer rolls onto his nonfiring side, placing the nonfiring elbow close to the side of the magazine. He places the rifle butt in the pocket formed by the firing shoulder, grasps the pistol grip with his firing hand, and lowers the firing elbow to the ground. The rifle rests in the V formed by the thumb and fingers of the nonfiring hand. The soldier adjusts the position of his firing elbow until his shoulders are about level, and pulls back firmly on the rifle with both hands. To complete the position, he obtains a stock weld and relaxes, keeping his heels close to the ground.

**Advanced Positions.** After mastering the four marksmanship fundamentals in the two basic firing positions, the soldier is taught the advanced positions. He is trained to assume different positions to adapt to the combat situation.

*Alternate prone position.* This position is an alternative to both prone supported and unsupported fighting positions, allowing the firer to cock his firing leg. The firer can assume a comfortable position while maintaining the *same* relationship between his body and the axis of the rifle. This position relaxes the stomach muscles and allows the firer to breathe naturally.

*Kneeling supported position.* This position allows the soldier to obtain the height necessary to better observe many target areas, taking advantage of available cover. Solid cover that can support any part of the body or rifle assists in firing accuracy.

*Kneeling unsupported position.* This position is assumed quickly, places the soldier high enough to see over small brush, and provides for a stable firing position. The nonfiring elbow should be pushed forward of the knee so that the upper arm is resting on a flat portion of the knee to provide stability. The trailing foot can be placed in a comfortable position.

*Standing position.* To assume the standing position, the soldier faces his target, executes a facing movement to his firing side, and spreads his feet a comfortable distance apart. With his firing hand on the pistol grip and his nonfiring hand on either the upper handguard or the bottom of the magazine, the soldier places the butt of the rifle in the pocket formed by his firing shoulder so that the sights are level with his eyes. The weight of the rifle is supported by

the firing shoulder pocket and nonfiring hand. The soldier shifts his feet until he is aiming naturally at the target and his weight is evenly distributed on both feet. The standing position provides the least stability but could be needed for observing the target area since it can be assumed quickly while moving. Support for any portion of the body or rifle improves stability. More stability can be obtained by adjusting the ammunition pouch to support the nonfiring elbow, allowing the rifle magazine to rest in the nonfiring hand.

**Modified Firing Positions.** Once the basic firing skills have been mastered during initial training, the soldier should be encouraged to modify positions, to take advantage of available cover, to use anything that helps to steady the rifle, or to make any change that allows him to hit more combat targets. The position shown in uses sandbags to support the handguard and frees the nonfiring hand to be used on any part of the rifle to hold it steady.

**NOTE:** Modified positions can result in small zero changes due to shifting pressure and grip on the rifle.

**MOUT Firing Positions.** Although the same principles of rifle marksmanship apply, the selection and use of firing positions during MOUT requires some special considerations. Firing from around corners could require the soldier to fire from the opposite shoulder to avoid exposing himself to enemy fire.

The requirement for long-range observation can dictate that positions be occupied that are high above ground. shows a soldier firing over rooftops, exposing only the parts of his body necessary to engage a target. [Figure 3-16](#) shows a soldier firing around obstacles. highlights the need to stay in the shadows while firing from windows, and the requirements for cover and rifle support.

## TRAINING

Dry-fire training and live-fire training are necessary to mastering basic rifle marksmanship. The soldier must adhere to the following procedures and applications to be effective in combat.

**Dry-Fire Exercises.** Repeated training and dry-fire practice are the most effective means available to ensure all soldiers can function efficiently after dark.

Target detection and dry-fire exercises must be conducted before the first live round is fired. They can take place almost anywhere -elaborate live-fire range facilities are not needed. Modified fundamentals can be taught in a classroom/practical exercise situation. Further training in the proper zeroing and engagement techniques can take place anywhere that targets can be set up and darkness can be expected.

Without extensive dry-fire training, soldiers do not perform to standards during live fire. Valuable range time and ammunition are wasted in a final attempt to teach the basics.

The soldier must demonstrate skill during daylight live fire. Next, he is trained in the differences and modifications needed for successful night firing. Many dry-fire exercises are conducted until skill at night firing is displayed. Only then is the soldier ready to move on to the night live-fire exercises.

**Live-Fire Exercises.** These exercises continue to develop the firing skills acquired during dry-fire exercises, and they allow the soldier to experience the effects of darkness on downrange performance.

The basic unassisted live-fire exercise allows all soldiers to apply night-fire principles, and to gain confidence in their abilities to effectively engage targets at 25 and 50 meters. Practice and proficiency firing can be conducted on any range equipped with mechanical lifters and muzzle flash simulators. A small square of reflective material and a shielded low wattage flashing light (protected from bullet impact) may be used to facilitate target detection. ([Figures 5-3](#)) The light should be placed to highlight the center of the target with a flashing, faint glow (intended to represent a muzzle flash). The light should not be on constantly, when the target is not exposed, or on when the target is exposed but not being used in actual engagement. The light should provide the firer with a momentary indication that a target is presenting itself for engagement. It should not be attached to the target or provide the firer with a distinct aiming point, regardless of how dim it may be. Practice can also be accomplished by the use of MILES equipment and target interface devices.

When an automated record fire range (RETS) is used for this exercise, the two 50-meter mechanisms are used. Before training, one E-type silhouette target is replaced with an F-type silhouette target. The F-type silhouette target is engaged at 25 meters from the prone unsupported position. The soldier is issued one magazine of 15 rounds (5 rounds ball; 10 rounds tracer) and presented 15 ten-second exposures. The firing line is moved, and the soldier engages the E-type silhouette target at 50 meters. He is issued a second 15-round magazine (5 rounds ball; 10 rounds tracer) to engage 15 ten-second exposures.

When the automated range is used, the soldier's performance is recorded in the tower. If automatic scoring is not available, F-type and E-type silhouette paper facings are attached to the mechanical target, and bullet holes are counted. Facings may be repaired or replaced for each firer.

To meet the annual/semiannual minimum performance requirements, all soldiers must hit and kill seven separate targets out of 30 exposures. The results are annotated on the soldier's record fire scorecard.

- *Individual.* Application of immediate action, rapid magazine changes, and refinements of the modified quick-fire aiming point should be tested and evaluated for further training.
  - *Unassisted.* After soldiers exhibit proficiency of individual tasks, training and evaluation at ranges beyond those possible using only the rifle are indicated.
  - *Artificial illumination.* After mastering the unassisted night fire task and after repeated dry-fire training under artificial illumination, the soldier is ready to be tested and evaluated using live fire under illumination. Pop-up or stationary targets at ranges out to 175 meters (depending on light conditions, terrain features, and vegetation) may be used. Illumination is provided by flares, mortar/artillery, or floodlights. Once these tasks are mastered, further training and evaluation using NVDs is indicated. Multipurpose range complexes can be used for night firing by using artificial illumination. Automated field fire or record fire ranges can also be used by adding lighting. During this training, soldiers engage targets at 75 to 175 meters. Several target scenarios are possible. A typical training exercise would present 30 random exposures of the 75-meter and 175-meter targets (or optional 100-meter and 200-meter targets). Soldiers should be expected to hit at least 10 targets. Tracer ammunition can be used to enhance training.

- *Night vision devices.* Repeated training and dry-fire practice on the proper use of NVDs are essential to the successful conduct of any live-fire training using these devices. Firers must understand the equipment and skillfully employ it. NVDs can provide engagement capabilities out to 300 meters.

**NOTE:** Spotlights or floodlights can be modified through use of a rheostat to simulate the flickering, bright/dim nature of artificial illumination. Lights should not be used to continuously spotlight targets. Unanticipated artificial illumination may render NVDs difficult to see through or may shut the device off. Live-fire training should consider any problems incurred by such unexpected illumination.

- *Unit.* Parts of unit STXS, FTXS, and LFXs should be conducted at night. This training should include target detection, unassisted MILES and live fire, artificial illumination, and NVDS. Targets out to 300 meters may be used, depending on the existing conditions. Emphasis is on soldier knowledge and skills displayed.

## TRAINING STRATEGY

Training strategy is the overall concept for integrating resources into a program to train individual and collective skills needed to perform a unit's wartime mission.

Training strategies for rifle marksmanship are implemented in TRADOC institutions (IET, NCOES, basic and advanced officer's courses) and in units. The overall training strategy is multifaceted and is inclusive of the specific strategies used in institution and unit programs. Also included are the supporting strategies that use resources such as publications, ranges, ammunition, training aids, devices, simulators, and simulations. These strategies focus on developing critical soldier skills, and on leader skills that are required for success in combat.

Two primary components compose the training strategies: **initial training** and **sustainment training**. Both may include individual and collective skills. Initial training is critical. A task that is taught correctly and learned well is retained longer and skills can be quickly regained and sustained. Therefore, initial training must be taught correctly the first time. However, eventually an individual or unit loses skill proficiency. This learning decay depends on many factors such as the difficulty and complexity of the task. Personnel turnover is a main factor in decay of collective skills, since the loss of critical team members requires retraining to regain proficiency. If a long period elapses between initial and sustainment training sessions or training doctrine is altered, retraining may be required. The training strategy for rifle marksmanship begins in IET and continues in the unit. An example of this overall process is illustrated in [Figure 1-1](#) and provides a concept of the flow of unit sustainment training ([Appendix A](#)). JET provides field units with soldiers who have been trained and who have demonstrated proficiency to standard in basic marksmanship tasks. The soldier graduating from these courses has been trained to maintain the rifle and to hit a point target. He has learned target detection, application of marksmanship fundamentals, and other skills needed to engage a target. The specific tasks and programs taught in IET are explained in [Appendix A](#), FM 21-3, and in commanders' manuals.

Training continues in units on the basic skills taught in IET. Additional skills such as area fire are trained and then integrated into collective training exercises, which include platoon and squad live-fire STXs. (A year-round unit marksmanship training program is explained in [Appendix A](#).) The strategy for sustaining the basic marksmanship skills taught in IET is periodic preliminary rifle instruction, followed by instructional and qualification range firing. However, a unit must set up a year-round program to sustain skills. Key elements include training of trainers, refresher training of nonfiring skills, and use of the Weaponeer or other devices for remedial training. Additional skills trained in the unit include semiautomatic and automatic area fires, night fire, MOPP firing, and moving target training techniques. Related soldier skills of camouflage, cover and concealment, fire and movement, and preparation and selection of a fighting position are addressed in FM 21-3, which must be integrated into tactical training.

In the unit, individual and leader proficiency of marksmanship tasks are integrated into collective training to include squad, section, and platoon drills and STXS; and for the collective tasks in these exercises, and how they are planned and conducted, are in the MTP and battle drills books for each organization. (Force-on-force exercises using MILES are discussed in detail in TC 25-6). Based on the type organization, collective tasks are evaluated to standard and discussed during leader and trainer after-action reviews. Objective evaluations of both individual and unit proficiency provide readiness indicators and future training requirements.

A critical step in the Army's overall marksmanship training strategy is to train the trainers and leaders first. Leader courses and unit publications develop officer and NCO proficiencies necessary to plan and conduct marksmanship training and to evaluate the effectiveness of unit marksmanship programs. Training support materials are provided by the proponent schools to include field manuals, training aids, devices, simulators, and programs that are doctrinal foundations and guidance for training the force.

Once the soldier understands the weapon and has demonstrated skill in zeroing, additional live-fire training and a target acquisition exercise at various ranges are conducted. Target types and scenarios of increasing difficulty must be mastered to develop proficiency.

Initial individual training culminates in the soldier's proficiency assessment, which is conducted on the standard record fire range or approved alternates. This evaluation also provides an overview of unit proficiency and training effectiveness.

General marksmanship training knowledge and firing well are acquired skills, which perish easily. Skill practice should be conducted for short periods throughout the year. Most units have a readiness requirement that all soldiers must zero their rifles within a certain time after unit assignment. Also, soldiers must confirm the zeros of their assigned rifles before conducting a qualification firing. Units should conduct preliminary training and practice firing



throughout the year due to personnel turnover. A year-round marksmanship sustainment program is needed for the unit to maintain the individual and collective firing proficiency requirements to accomplish its mission (see [Appendix A](#)).

# Target Detection and Exercises

*The material contained in this appendix provides the detailed information on the skills required for proper target detection and identification. The exercises contained herein will train and sustain those skills.*

## Section I. TARGET DETECTION AND ENGAGEMENT

Target detection is the process of locating, marking, and determining the range to combat targets. For most soldiers, finding the target can be a greater problem than hitting it. Target detection must be conducted as part of individual training and tactical exercises and must be integrated into night live-fire exercises. The observation lines on target detection ranges approximate the location a soldier might occupy when in combat. Provisions must be made to incorporate night target detection.

### TARGET LOCATION

The ability to locate a combat target depends on the observer's position and skill in searching and maintaining observation of an area, and the target indications of the "enemy" during day or night.

**Selection of a Position.** A good position is one that offers maximum visibility of the area while affording cover and concealment. Position has two considerations -- the observer's tactical position in a location and his body position at that location.

Usually, the firer is told where to prepare his defensive position. However, some situations (such as the attack and reorganization on the objective) require him to choose his own defensive position.

Although target training courses prescribe conferences and demonstrations on choice of steady firing positions, the instruction does not normally include applying this skill. Therefore, instructors/trainers must emphasize the importance of the observer's position when conducting practical exercises in other target-detection techniques.

**Observation of an Area.** When a soldier moves into a new area, he quickly checks for enemy activity that could be an immediate danger. This search entails quick glances at specific points throughout the area rather than just sweeping the eyes across the terrain. The eyes are sensitive to slight movements occurring within the arc on which they are focused. However, they must be focused on a certain point to have this sensitivity.

If the soldier fails to locate the enemy during the initial search, he then begins a systematic examination known as the 50-meter overlapping strip technique of search ([Figure B-1](#)). Normally, the area nearest the soldier offers the greatest danger to him. Therefore, the search begins with the terrain nearest the observer's position.

Beginning at either flank, the soldier searches the terrain to his front in a 180-degree arc that is 50 meters deep. After reaching the opposite flank, the soldier searches over a second 50-meter strip farther out but overlapping the first strip by about 10 meters. The soldier continues until the entire area has been searched.

To benefit from his side vision, the soldier looks at certain points as he searches from one flank to the other. He remembers prominent terrain features and areas that offer cover and concealment to the enemy, learning the terrain as he searches it.

After completing his detailed search, the soldier maintains observation of the area. He should use a technique the same as his initial quick search of the area. He uses quick glances at various points throughout the entire area, focusing his eyes on certain features as he conducts this search. He devises a set sequence of searching the area to ensure complete coverage of all terrain. Since this quick search could fail to detect the initial enemy movement, the soldier routinely repeats a systematic search of the area. This systematic search is conducted anytime the attention of the soldier has been distracted from his area of responsibility.

**Target Indicators.** A target indicator is anything a soldier (friendly or enemy) does or fails to do that reveals his position. Since these indicators apply to both sides of the battlefield, a soldier learns target indicators from the standpoint of locating the enemy. At the same time, he must prevent the enemy from using the same indicators to locate him. These indicators can be grouped into three areas for instruction: sound, movement, and identifiable shapes.

**Sound.** Potential targets indicated by sounds (footsteps, coughing, or equipment noises) provide only a direction and general location. It is difficult to pin-point a specific target's location only by sound. However, the fact that an observer was alerted by a sound greatly increases the chances that he will locate the target through subsequent target indicators.

*Movement.* The problem in locating moving targets depends mainly on the speed of movement. Slow, deliberate movements are much harder to notice than those that are quick and jerky. The techniques previously outlined are the best procedures for locating moving targets.

*Identifiable shapes.* The lack of or poor use of camouflage and concealment are indicators that reveal most of the targets on the battlefield. Light reflecting from shiny surfaces or a contrast that presents a clearly defined outline are indicators easily noticed by an alert observer. For instruction, camouflage indicators are divided into three groups:

- **Shine.** Items such as belt buckles or other metal objects reflect light and act as a beacon to the wearer's position; therefore, such objects should be camouflaged. This is true during the day or night.
- **Outlines.** The human body and most types of military equipment are outlines known to all soldiers. The reliability of this indicator depends upon the visibility and experience of the observer. On a clear day, most soldiers can identify the enemy or equipment if there is a distinct outline. During poor visibility, it is not only harder to see outlines, but inexperienced troops often mistake stumps and rocks for enemy soldiers. Therefore, the soldier should learn the terrain during good visibility.
- **Contrasts.** If a soldier wearing a dark uniform moves in front of a snowbanks the contrast between the white snow and dark uniform makes him clearly visible. However, if he wears a white (or light-colored) uniform, he is harder to see. Contrast with the background is one of the hardest target indicators to avoid. During operations in which the soldier is moving, he is usually exposed to many types of color backgrounds. No camouflage uniform exists that can blend into all backgrounds. Therefore, a moving soldier must always be aware of the surrounding terrain and vegetation. A parapet of freshly dug earth around a fighting position is noticeable. Even if camouflaged, the position can still be located due to the materials used for concealing. Camouflage materials are usually cut from vegetation close by but eventually wilt and change color. An observer, seeing an area that has been stripped of natural growth, can assume there are close camouflaged emplacements.

## TARGET MARKING

When a target has been located, the soldier should mark its location in relation to visible terrain or a man-made feature. If the soldier observes several targets at one time, he can fire on only one of them; therefore, he must mark the locations of the others for later engagement. To mark the location of a target, the soldier uses an aiming or reference point. An aiming point is a feature directly on line between the soldier and target, such as a tree trunk, which is usually the most effective means of delivering accurate fire. Using a reference point or aiming point to mark targets moving from one location to another depends on the following factors:

**Number of Targets.** If several targets appear and disappear at the same time, the point of disappearance of each is hard to determine.

**Exposure Time.** Usually, moving targets are exposed for only a short period; therefore, the observer must be alert to see the point of disappearance for most of the targets.

**Target Spacing.** The greater the distance between targets, the harder it is to see the movements of each. When there is a great distance between targets, the observer should carefully locate and mark the one nearest his position first.

**Aiming Points.** Aiming points can be either good or poor. Good aiming points are easily determined in the nearby terrain. Targets disappearing behind good aiming points, such as man-made objects and large terrain features, can be easily marked for future engagement. Poor aiming points are not easily distinguishable within the surrounding terrain. Targets disappearing behind poor aiming points are hard to mark and are easily lost, and they should be engaged first.

## RANGE DETERMINATION

Range determination is the process of finding the distance between two points -- one point is usually the observer's own position and the other a target or prominent feature. Range determination is an important skill in completing several types of missions since it affects combat marksmanship proficiency. It is needed in reporting information, and in adjusting artillery and mortar fires.

Many techniques are used to determine range: measuring distances on maps, pacing the distance between two points, using an optical range finder. However, the soldier does not usually have a map, and he rarely has access to an optical range finder. Pacing the distance between two points is one technique a soldier can use, as long as the enemy is not near. A sector sketch is a rough schematic map of an observer's area of responsibility ([Figure B-2](#)). It shows the range and direction from the soldier's position to recognizable objects, terrain features, avenues of approach, and possible enemy positions. The soldier paces the distance between his position and reference points to

reduce range errors. By referring to the sector sketch, the soldier can quickly find the range to a target appearing near a reference point.

**The 100-Meter Unit-of-Measure Technique.** To use this technique, the soldier must visualize a distance of 100 meters on the ground. For ranges up to 500 meters, he determines the number of 100-meter increments between the two points ([Figure B-3](#)). Beyond 500 meters, the soldier must select a point halfway to the target, determine the number of 100-meter increments to the halfway point, and then double it to find the range to the target ([Figure B-4](#)). During training exercises, the soldier must be aware of the effect that sloping ground has on the appearance of a 100-meter increment. Ground that slopes upward gives the illusion of greater distance and soldiers have a tendency to overestimate a 100-meter increment. Conversely, ground that slopes downward gives the illusion of a shorter distance; therefore, the soldier tends to underestimate.

To obtain proficiency in the 100-meter unit-of-measure technique requires dedicated practice. Throughout training, the soldier should compare his estimated range to the actual range determined by pacing or other reliable means. The best training technique is to require the soldier to pace the range after he has made a visual estimation, realizing the actual range for himself. This teaches him more than being told by the instructor/trainer.

One shortcoming of the 100-meter unit-of-measure technique is that its accuracy depends upon the amount of visible terrain for ranges up to 500 meters. If a target appears at a range greater than 500 meters, and the soldier can see only a portion of the ground between himself and the target, it is hard to accurately use the 100-meter unit-of-measure technique.

**The Appearance-of-Objects Technique.** This technique determines range by the size of the object observed. This is a common technique of determining distances and is used by most people in their everyday living. For example, a motorist trying to pass another car must judge the distance of an oncoming vehicle. He does this based on his knowledge of how vehicles appear at various distances. Suppose the motorist knows that at a distance of 1 mile an oncoming vehicle seems to be 1 inch wide and 2 inches high. Then, anytime he sees another oncoming vehicle that fits this dimension, he knows it is about 1 mile away. This same technique can be used by the firer to determine ranges on the battlefield. If he knows the size and detail of personnel and equipment at known ranges, then he can compare these traits to like objects at unknown ranges -when the traits match, so do the ranges.

**The Front Sight Post Estimation.** The front sight post can be used to estimate range. The targets in [Figure B-4](#) show the soldier perceives the front sight post to be the same width as a man-size target when the target is located at a distance of 175 meters. A man can be covered using half of the front sight post when the range to the target is doubled to 350 meters. An easy rule to remember: if the target is bigger than the front sight post, the target must be within 175 meters; when the target is less than the full width of the front sight post, the target is beyond 175 meters. The silhouette zeroing target provides the same perception to the firer as a man-sized target at 250 meters. The various scaled-silhouette targets provide a means for soldiers to practice range estimation with the front sight post. This is a method of dry-fire training, and soldiers should be aware of the importance of range estimation during all of their marksmanship training.

## **PRACTICE RECORD FIRE**

Practice record fire is a training exercise designed to progressively develop and refine the soldiers combat firing skills. During this exercise, the soldier is exposed to a more difficult course of fire with increased time stress to include single and multiple target engagements at six distances ranging from 50 to 300 meters. This exercise also provides the opportunity to practice and demonstrate skills learned during target detection. To perform well, a soldier must integrate all the tasks learned from previous training. When firing exercises are properly organized, conducted, and critiqued, the soldier gains knowledge and confidence in his firing performance. Through close observation, coaching, and critiquing, instructors/trainers can base remedial training on specific needs.

## **RECORD FIRE**

Qualification ratings and first-time GO rates are important during record fire, if properly used. They provide goals for the soldier and aid the commander in identifying the quality of his training. This should be considered in the assignment of priorities, instructor personnel, and obtaining valuable training resources. The objective of record firing is to assess and confirm the individual proficiency of firers and the effectiveness of the training program. (See [Appendix A](#) for information on unit training and [Appendix G](#) for detailed information on record fire.)

## PEER COACHING

Peer coaching is using two soldiers of equal firing proficiency and experience to assist (coach) each other during marksmanship training. Some problems exist with peer coaching. If the new soldier does not have adequate guidance, a "blind-leading-the-blind" situation results, which can lead to negative training and safety violations. However, when adequate instruction is provided, peer coaching can be helpful even in the IET environment. Since all soldiers in units have complete BRM, peer coaching should yield better results.

**Benefits.** The pairing of soldiers can enhance learning for both of them. The coach learns what to look for and what to check as he provides guidance to the firer. Communication between peers is different than communication between a firer and drill sergeant or senior NCO. Peers have the chance to ask simple questions and to discuss areas that are not understood. Pairing soldiers who have demonstrated good firing proficiency with those who have firing problems can improve the performance of problem firers.

**Duties.** The peer coach assists the firer in obtaining a good position and in adjusting sandbags. He watches the firer - **not the target** - to see that the firer maintains a proper, relaxed, steady position; that he holds his breath before the final trigger squeeze; that he applies initial pressure to the trigger; and that no noticeable trigger jerk, flinch, eye blink, or other reaction can be observed in anticipating the rifle firing. The peer coach can use an M16 sighting device, allowing him to see what the firer sees through the sights.

The peer coach can load magazines, providing a chance to use ball and dummy. At other times, he could be required to observe the target area - for example, when field-fire targets are being engaged and the firer cannot see where he is missing targets. The peer coach can add to range safety procedures by helping safety personnel with preliminary rifle checks.

**NOTE:** When a peer coach is used during M16A1 live-fire exercises, a brass deflector should be attached to the rifle and eye protection should be worn.

## MOPP FIRE EXERCISES

The many difficulties the soldier encounters while firing with MOPP gear must be experienced and overcome during training.

**Dry-Fire MOPP Exercises.** Repeated dry-fire exercises covering all aspects of MOPP firing are the most effective means available to ensure all soldiers can function during a live-fire MOPP situation. Multiple dry-fire exercises must be conducted before the first live round is fired. Otherwise, valuable ammunition and training time are wasted in trying to teach soldiers the basics. The soldier is trained in the fundamentals; repeated dry-fire or Weaponeer exercises are conducted; grouping, zeroing, qualifying, and evaluating are performed using standard non-MOPP firing; the differences and modifications are trained for MOPP firing; and repeated MOPP dry-fire exercises are conducted. The soldier is now ready to move on to MOPP live fire.

**Live-Fire MOPP Exercises.** These exercises further develop the learned firing skills and allow the soldier to experience the effects of wearing MOPP equipment on downrange performance.

*Individual* Application of immediate action, rapid magazine changes, grouping, and adjusted point of aim at 25 meters should all be tested and evaluated for further training. After soldiers exhibit proficiency at these tasks, further training and evaluation at extended ranges are indicated.

*Unit.* Parts of unit LFXs should be conducted in the highest MOPP level with a planned system of target hit evaluation. As in all aspects of marksmanship training, the emphasis is on soldier knowledge and skills displayed.

**Basic 25-meter proficiency course.** Initial live-fire exercises are conducted at 25 meters. This training provides all soldiers the basic techniques and introduces firing the rifle in MOPP equipment. This basic proficiency exercise must be fired while wearing gloves and protective mask with hood. The basic 25-meter proficiency exercise is fired to standard and is an annual/semiannual GO/NO-GO requirement for most soldiers. It is entered on the record fire scorecard when completed.

The course of fire can be conducted on any range equipped with mechanical target lifters. Soldiers are given initial instruction and a demonstration of the techniques of firing in MOPP equipment.

Each soldier is issued 20 rounds of 5.56-mm ball ammunition to engage 20 three-to-five-second exposures of F-type silhouette targets at 25 meters. Initial firing is performed with 10 rounds from the individual fighting position (supported), and 10 rounds from a prone unsupported position. Each soldier must obtain a minimum of 11 target hits out of 20 exposures to meet the basic requirement. This initial basic 25-meter exercise prepares soldiers for future individual and unit training in full MOPP gear.

**Downrange feedback** Once the soldier has mastered basic marksmanship proficiency, he should be introduced to firing at range. This phase of firing should provide the maximum hit-and-miss performance feedback; it can be conducted on a KD or modified field fire range at 75, 175, and 300 meters.

Practice firing under full MOPP can also be conducted on the standard RETS ranges -for example, the standard record fire tables may be fired in MOPP. MOPP fire must also be part of unit tactical exercises, which are fired on MPRC as part of STXS.

**NOTE:** The .22-caliber rimfire adapter or plastic practice ammunition may be used during live-fire practice at scaled 25-meter targets when 5.56-mm ammunition is not available.

When the rimfire adapter, plastic ammunition, or live-fire range is not available, the Weaponeer device may be used. Scaled silhouette targets may also be used at this distance to introduce the many target sizes common at longer ranges. The slow-fire target and course outlined in are appropriate.

Having mastered the 25-meter firing phase, the soldier is then introduced to firing at range, using the standard 75-, 175-, and 300-meter downrange feedback targets. Adjusted point of aim, for individual differences of cant, is first used during this training. Live-fire training is conducted on a KD or modified field fire range, giving the soldier feedback on targets engaged at many ranges,

# Night Firing

*All units must be able to fight during limited visibility. All soldiers should know the procedures for weapons employment during such time. Soldiers must experience the various conditions of night combat -- from total darkness, to the many types of artificial illumination, to the use of surveillance aids. All units must include basic, unassisted night fire training annually in their unit marksmanship program. Combat units should conduct tactical night fire training at least quarterly. This tactical training should include MILES during force-on-force training as well as live fire. Night-fire training must include the use of applicable night vision devices when this equipment is part of a TOE. The many effects darkness has on night firing are discussed herein.*

**NOTE:** Although this chapter addresses night firing, the appropriate modifications to the fundamentals of firing may be applied whenever visibility is limited.

## CONSIDERATIONS

Trainers must consider the impact of limited visibility on the soldier's ability to properly apply the fundamentals of marksmanship and combat firing skills. These fundamentals/ skills include:

**Operation and Maintenance of the Weapon.** Handling the weapon, performing operation and function checks, loading and unloading, and maintenance are affected by nighttime conditions. Movements are slowed, tasks take longer to complete, vision is impaired, and equipment is more easily misplaced or lost. Because combat conditions and enforcement of noise and light discipline restrict the use of illumination, soldiers must be trained to operate (load, unload, and clear), service, and clean their weapons using the lowest lighting conditions. Although initial practice of these tasks should occur during daylight (using simulated darkness) to facilitate control and error correction, repeated practice during actual nighttime conditions should be integrated with other training. Only through repeated practice and training can the soldier be expected to perform all tasks efficiently.

**Immediate Action.** Under normal conditions, a soldier should clear a stoppage in three to five seconds. After dark, this task usually takes longer. Identifying the problem may be frustrating and difficult for the soldier. A tactile (hands only) technique of identifying a stoppage must be taught and practiced. Clearing the stoppage using few or no visual indicators must also be included. The firer must apply immediate action with his eyes closed. Dry-fire practice using dummy or blank rounds under these conditions is necessary to reduce time and build confidence. Training should be practiced first during daylight for better control and error correction by the trainer. Practice during darkness can be simulated by closing the eyes or using a blindfold. Once the soldier is confident in applying immediate action in daylight or darkness, he can perform such actions rapidly on the firing line.

**Target Detection.** Many of the skills discussed in apply to target detection after dark. Light from a cigarette or flashlight, discharge of a rifle (muzzle flash), or reflected moonlight/starlight are the main means of target location. Sounds may also be indicators of target areas. Because the other techniques of detection (movement, contrast) are less apparent at night, light and sound detection must be taught, trained, and reviewed repeatedly in practice exercises. Exercises should also emphasize shortened scanning ranges, night vision adaptation, and use of off-center vision. Target detection exercises should be integrated into all collective training tasks.

**NOTE:** Binoculars are often overlooked as night vision aids. Because they amplify the available light, binoculars or spotting/rifle scopes can provide the firer with another means to locate targets during limited visibility. Also, the use of MILES equipment is effective for use in engaging detected targets.

**Marksmanship Fundamentals.** The four marksmanship fundamentals apply to night firing. Some modifications are needed depending on the conditions. The firer must still place effective fire on the targets or target areas that have been detected.

**Steady position.** When the firer is firing unassisted, changes in his head position/stock weld will be necessary, especial when using weapon-target alignment techniques. When using rifle-mounted night vision devices, head position/stock weld must be changed to bring the firing eye in line with the device. Also, such mounted devices alter the rifle's weight and center of gravity, forcing a shift in placement of the support (nonfiring arm or sandbags). Repeated dry-fire practice, followed by live-fire training, is necessary to learn and refine these modifications and still achieve the most steady position.

**Aiming.** Modifications to the aiming process vary from very little (when using LLLSSs) to extensive (when using modified quick-fire techniques). When firing unassisted, the firer's off-center vision is used instead of pinpoint focus. When using a mounted night vision device, the firer's conventional iron sights are not used. The soldier uses the necessary aiming process to properly use the device.

**Breathing.** Weapon movement caused by breathing becomes more apparent when using night vision devices that magnify the field of view. This fundamental is not greatly affected by night fire conditions.



*Trigger squeeze.* This important fundamental does not change during night fire. The objective is to not disrupt alignment of the weapon with the target.

## PRINCIPLES OF NIGHT VISION

For a soldier to effectively engage targets at night, he must apply the three principles of night vision:

**Dark Adaptation.** Moving from lighted to darkened areas (as in leaving a tent) can be temporarily blinding. After several minutes have passed, the soldier can slowly see his surroundings. If he remains in this completely darkened environment, he adapts to the dark in about 30 minutes. This does not mean he can see in the dark at the end of this time. After about 30 minutes, his visibility reaches its maximum level. If light is encountered, the eyes must adapt again. The fire on the end of a cigarette or a red-lensed flashlight can degrade night vision; larger light sources cause more severe losses.

**Off-Center Vision.** During the day, the soldier focuses his vision on the object he wants to see. Shifting this pinpoint focus slightly to one side causes the object to become blurry or lose detail. At night, the opposite is true. Focusing directly on an object after dark results in that object being visible for only a few seconds. After that, the object becomes almost invisible. To view an object at night, the soldier must shift his gaze slightly to one side. This allows the light-sensitive parts of the eye (parts not used during daylight) to be used. These can detect faint light sources or reflections and relay their image to the brain.

**NOTE:** Vision is shifted slightly to one side, but attention is still on the object. Because of the blind spot at the center of vision, directing attention to an off-centered objective is possible (with practice).

**Scanning.** Scanning is the short, abrupt, irregular movement of the soldier's eyes around an object or area every 4 to 10 seconds. Off-center vision is used. Scanning ranges vary according to visibility.

**NOTE:** For detailed information on the three principles, see [FM 21-75](#).

## TARGET ENGAGEMENT TECHNIQUES

Night fire usually occurs under three general conditions.

**Unassisted Firing Exercise.** The firer must detect and engage targets without artificial illumination or night vision devices. Potential target areas are scanned. When a target is detected, the firer should engage it using a modified quick-fire position. His head is positioned high so that he is aligning the weapon on the target and looking just over the iron sights. His cheek should remain in contact with the stock.

The firer should take a few seconds to improve weapon/target alignment by pointing slightly low to compensate for the usual tendency to fire high. Both eyes are open to the maximum advantage of any available light, and the focus is downrange. Off-center vision is used to keep the target in sight. Tracer ammunition may provide feedback on the line of trajectory and facilitate any adjustments in weapon/target alignment.

Repeated dry-fire training, target detection, and proper aiming practice are the most efficient means to ensure the soldier can successfully engage short-range targets (50 meters or closer) unassisted during MILES exercises, and then live-fire training.

**Artificial Illumination.** Targets as distant as 175 meters can be engaged successfully with some type of artificial illumination. Illumination may be from hand flares, mortar or artillery fire, or bright incandescent lights such as searchlights.

When artificial illumination is used, the eyes lose most of their night adaption, and off-center vision is no longer useful. Aiming is accomplished as it is during the day. Artificial illumination allows the firer to use the iron sights as he does during the day. (M16A2 users should keep the large rear sight aperture flipped up during darkness.)

Engaging targets under artificial illumination allows for better target detection and long-range accuracy than the unassisted technique. When the light is gone, time must be spent in regaining night vision and adaptation. Only when the light level drops enough so that the target cannot be seen through the iron sights should the firer resume short-range scanning, looking just over the sights.

Soldiers have sometimes been taught to close their eyes during artificial illumination to preserve their night vision.

This technique is effective but also renders the soldier (or entire unit) blind for the duration of the illumination.

Keeping one eye closed to preserve its night vision results in a drastically altered sense of perception when both eyes are opened, following the illumination burnout. Tactical considerations should be the deciding factor as to which

technique to use. Repeated dry-fire training and target detection practice are the keys to successful engagement of targets out to 150 meters or more during live fire under artificial illumination.

**Night Vision Devices.** Rifle-mounted night vision devices are the most effective night fire aids. By using these devices, the firer can observe the area, detect and engage any suitable targets, and direct the fire of soldiers who are firing unassisted.

NVDs can be used to engage targets out to 300 meters. Repeated training, dry-fire practice, and correct zeroing are vital to the proper employment of NVDs during live-fire training.

## Section V. MOPP FIRING

All soldiers must effectively fire their weapons to accomplish combat missions in an NBC environment. With proper training and practice, soldiers can gain confidence in their ability to effectively hit targets in full MOPP equipment. MOPP firing proficiency must be a part of every unit's training program.

### EFFECTS OF MOPP EQUIPMENT ON FIRING

Firing weapons is only part of overall NBC training. Soldiers must first be familiar with NBC equipment, its use, and proper wear before they progress to learning the techniques of MOPP firing. Trainers must consider the impact of MOPP equipment (hood/ mask, gloves, overgarments) on the soldier's ability to properly apply the fundamentals of marksmanship and combat firing skills.

**Immediate Action.** Under normal conditions a soldier should be able to *clear a* stoppage in three to five seconds. Under full MOPP, however, this may take as long as ten seconds to successfully complete. Dry-fire practice under these conditions is necessary to reduce time and streamline actions. Hood/mask and gloves must be worn. Care must be taken not to snag or damage the gloves or dislodge the hood/mask during movements. Applying immediate action to a variety of stoppages during dry fire must be practiced using dummy or blank ammunition until such actions can be performed by instinct.

**Target Detection.** Techniques and principles outlined in [Chapter 3](#) remain valid for target detection while in MOPP, but considerations must be made for limiting factors imposed by MOPP equipment.

Vision is limited to what can be seen through the mask lenses/faceplate. Peripheral vision is severely restricted. The lenses/faceplate may be scratched or partly fogged, thus further restricting vision. Soldiers requiring corrective lenses must be issued insert lenses before training.

Scanning movement may be restricted by the hood/mask. Any of these factors could adversely affect the soldier's ability to quickly and accurately detect targets. Additional skill practice should be conducted.

**Marksmanship Fundamentals.** Although the four marksmanship fundamentals remain valid during MOPP firing, some modifications may be needed to accommodate the equipment.

*Steady position.* Due to the added bulk of the overgarments, firing positions may need adjustment for stability and comfort. Dry and live firing while standing, crouching, or squatting may be necessary to reduce body contact with contaminated ground or foliage. A consistent spot/stock weld is difficult to maintain due to the shape of the protective masks. This requires the firer to hold his head in an awkward position to place the eye behind the sight.

*Aiming.* The wearing of a protective mask may force firers to rotate (cant) the rifle a certain amount to see through the rear aperture. The weapon should be rotated the least amount to properly see through and line up the sights, as previously discussed in [Chapter 3](#). The center tip of the front sight post should be placed on the ideal aiming point.

This ideal aiming procedure ([Figure 4-7](#)) should be the initial procedure taught and practiced. If this cannot be achieved, a canted sight picture may be practiced. *Breath control* Breathing is restricted and more difficult while wearing the protective mask. Physical exertion can produce labored breathing and make settling down into a normal breath control routine much more difficult. More physical effort is needed to move around when encumbered by MOPP equipment, which can increase the breath rate. All of these factors make holding and controlling the breath to produce a well-aimed shot more energy- and time-consuming. Emphasis must be placed on rapid target engagement during the limited amount of time a firer can control his breath.

*Trigger squeeze.* Grasping the pistol grip and squeezing the trigger with the index finger are altered when the firer is wearing MOPP gloves. The action of the trigger finger is restricted, and the fit of the glove may require the release of the swing-down trigger guard. Because the trigger feels different, control differs from that used in bare-handed firing. This difference cannot be accurately predicted. Dry-fire training using dime (washer) exercises is necessary to ensure the firer knows the changes he will encounter during live fire.

## MARKSMANSHIP FUNDAMENTALS

The soldier must understand the four key fundamentals before he approaches the firing line. He must be able to establish a **steady position** that allows observation of the target. He must **aim** the rifle at the target by aligning the sight system, and he must fire the rifle without disturbing this alignment by improper **breathing** or during **trigger squeeze**. The skills needed to accomplish these are known as **rifle marksmanship fundamentals**. These simple procedures aid the firer in achieving target hits under many conditions when expanded with additional techniques and information. Applying these four fundamentals rapidly and consistently is called the **integrated act of firing**. **Steady Position.** When the soldier approaches the firing line, he should assume a comfortable, steady firing position in order to hit targets consistently. The time and supervision each soldier has on the firing line are limited (illustrated on the following page in, Therefore, he must learn how to establish a steady position during dry-fire training. The firer is the best judge as to the quality of his position. If he can hold the front sight post steady through the fall of the hammer, he has a good position. The steady position elements are as follows:

*Nonfiring hand grip.* The rifle handguard rests on the heel of the hand in the V formed by the thumb and fingers. The grip of the nonfiring hand is light, and slight rearward pressure is exerted.

*Rifle butt position.* The butt of the stock is placed in the pocket of the firing shoulder. This reduces the effect of recoil and helps ensure a steady position.

*Firing hand grip.* The firing hand grasps the pistol grip so that it fits the V formed by the thumb and forefinger. The forefinger is placed on the trigger so that the lay of the rifle is not disturbed when the trigger is squeezed. A slight rearward pressure is exerted by the remaining three fingers to ensure that the butt of the stock remains in the pocket of the shoulder, thus minimizing the effect of recoil.

*Firing elbow placement.* The location of the firing elbow is important in providing balance. The exact location, however, depends on the firing/fighting position used - for example, kneeling, prone, or standing. Placement should allow shoulders to remain level.

*Nonfiring elbow.* The nonfiring elbow is positioned firmly under the rifle to allow for a comfortable and stable position. When the soldier engages a wide sector of fire, moving targets, and targets at various elevations, his nonfiring elbow should remain free from support.

*Stock weld.* The stock weld is taught as an integral part of various positions. Two key factors emphasized are that the stock weld should provide for a natural line of sight through the center of the rear sight aperture to the front sight post and to the target. The firer's neck should be relaxed, allowing his cheek to fall naturally onto the stock. Through dry-fire training, the soldier is encouraged to practice this position until he assumes the same stock weld each time he assumes a given position. This provides consistency in aiming, which is the purpose of obtaining a correct stock weld. Proper eye relief is obtained when a soldier establishes a good stock weld. There is normally a small change in eye relief each time he assumes a different firing position. Soldiers should begin by trying to touch his nose close to the charging handle when assuming a firing position.

*Support.* If artificial support (sandbags, logs, stumps) is available, it should be used to steady the position and to support the rifle. If it is not available, then the bones, not the muscles, in the firer's upper body must support the rifle.

*Muscle relaxation.* If support is properly used, the soldier should be able to relax most of his muscles. Using artificial support or bones in the upper body as support allows him to relax and settle into position. Using muscles to support the rifle can cause it to move.

*Natural point of aim.* When the soldier first assumes his firing position, he orients his rifle in the general direction of his target. Then he adjusts his body to bring the rifle and sights exactly in line with the desired aiming point. When using proper support and consistent stock weld, the soldier should have his rifle and sights aligned naturally on the target. When this correct body-rifle-target alignment is achieved, the front sight post must be held on target, using muscular support and effort. As the rifle fires, the muscles tend to relax, causing the front sight to move away from the target toward the natural point of aim. Adjusting this point to the desired point of aim eliminates this movement. When multiple target exposures are expected (or a sector of fire must be covered), the soldier should adjust his natural point of aim to the center of the expected target exposure area (or center of sector).

**Aiming.** Focusing on the front sight post is a vital skill the firer must acquire during practice. Having mastered the task of holding the rifle steady, the soldier must align the rifle with the target in exactly the same way for each firing. The firer is the final judge as to where his eye is focused. The instructor/trainer emphasizes this point by having the firer focus on the target and then focus back on the front sight post. He checks the position of the firing

eye to ensure it is in line with the rear sight aperture. He uses the M16 sighting device to see what the firer sees through the sights.

*Rifle sight alignment.* Alignment of the rifle with the target is critical. It involves placing the tip of the front sight post in the center of the rear sight aperture. Any alignment error between the front and rear sights repeats itself for every 1/2 meter the bullet travels. For example, at the 25-meter line, any error in rifle alignment is multiplied 50 times. If the rifle is misaligned by 1/10 inch, it causes a target at 300 meters to be missed by 5 feet.

*Focus of the eye.* A proper firing position places the eye directly on line with the center of the rear sight. When the eye is focused on the front sight post, the natural ability of the eye to center objects in a circle and to seek the point of greatest light (center of the aperture) aid in providing correct sight alignment. For the average soldier firing at combat-type targets, the natural ability of the eye can accurately align the sights. Therefore, the firer can place the tip of the front sight post on the aiming point, but the eye must be focused on the tip of the front sight post. This causes the target to appear blurry, while the front sight post is seen clearly. Two reasons for focusing on the tip of the front sight post are:

Only a minor aiming error should occur since the error reflects only as much as the soldier fails to determine the target center. A greater aiming error can result if the front sight post is blurry due to focusing on the target or other objects.

Focusing on the tip of the front sight post aids the firer in maintaining proper sight alignment.

*Sight picture.* Once the soldier can correctly align his sights, he can obtain a sight picture. A correct sight picture has the target, front sight post, and rear sight aligned. The sight picture includes two basic elements: sight alignment and placement of the aiming point.

Placement of the aiming point varies, depending on the engagement range. For example, shows a silhouette at 250 meters--the aiming point is the center of mass, and the sights are in perfect alignment; this is a correct sight picture.

A technique to obtain a good sight picture is the side aiming technique. It involves positioning the front sight post to the side of the target in line with the vertical center of mass, keeping the sights aligned. The front sight post is moved horizontally until the target is directly centered on the front sight post.

*Front sight.* The front sight post is vital to proper firing and should be replaced *when damaged*. Two techniques that can be used are the carbide lamp and the burning plastic spoon. The post should be blackened anytime it is shiny since precise focusing on the tip of the front sight post cannot be done otherwise.

*Aiming practice.* Aiming practice is conducted before firing live rounds. During day firing, the soldier should practice sight alignment and placement of the aiming point. This can be done by using training aids such as the M15AI aiming card and the Riddle sighting device.

**Breath Control.** As the firer's skills improve and as timed or multiple targets are presented, he must learn to hold his breath at any part of the breathing cycle. Two types of breath control techniques are practiced during dry fire.

- The first is the technique used during zeroing (and when time is available to fire a shot). There is a moment of natural respiratory pause while breathing when most of the air has been exhaled from the lungs and before inhaling. Breathing should stop after most of the air has been exhaled during the normal breathing cycle. The shot must be fired before the soldier feels any discomfort.
- The second breath control technique is employed during rapid fire (short-exposure targets). Using this technique, the soldier holds his breath when he is about to squeeze the trigger.

The coach/trainer ensures that the firer uses two breathing techniques and understands them by instructing him to exaggerate his breathing. Also, the firer must be aware of the rifle's movement (while sighted on a target) as a result of breathing.

**Trigger Squeeze.** A novice firer can learn to place the rifle in a steady position and to correctly aim at the target if he follows basic principles. If the trigger is not properly squeezed, the rifle is misaligned with the target at the moment of firing.

*Rifle movement.* Trigger squeeze is important for two reasons:

- First, any sudden movement of the finger on the trigger can disturb the lay of the rifle and cause the shot to miss the target.

- Second, the precise instant of firing should be a surprise to the soldier.

The soldier's natural reflex to compensate for the noise and slight punch in the shoulder can cause him to miss the target if he knows the exact instant the rifle will fire. The soldier usually tenses his shoulders when expecting the rifle to fire, but it is difficult to detect since he does not realize he is flinching. When the hammer drops on a dummy round and does not fire, the soldier's natural reflexes demonstrate that he is improperly squeezing the trigger.

*Trigger finger.* The trigger finger (index finger on the firing hand) is placed on the trigger between the first joint and the tip of the finger (not the extreme end) and is adjusted depending on hand size, grip, and so on. The trigger finger must squeeze the trigger to the rear so that the hammer falls without disturbing the lay of the rifle. When a live round is fired, it is difficult to see what affect trigger pull had on the lay of the rifle. Therefore, it is important to experiment with many finger positions during dry-fire training to ensure the hammer is falling with little disturbance to the aiming process.

As the firer's skills increase with practice, he needs less time spend on trigger squeeze. Novice firers can take five seconds to perform an adequate trigger squeeze, but, as skills improve, he can squeeze the trigger in a second or less. The proper trigger squeeze should start with slight pressure on the trigger during the initial aiming process. The firer applies more pressure after the front sight post is steady on the target and his is holding his breath.

The coach/trainer observes the trigger squeeze, emphasizes the correct procedure, and checks the firer's applied pressure. He places his finger on the trigger and has the firer squeeze the trigger by applying pressure to the coach/trainer's finger. The coach/trainer ensures that the firer squeezes straight to the rear on the trigger avoiding a left or right twisting movement. A steady position reduces disturbance of the rifle during trigger squeeze.

From an unsupported position, the firer experiences a greater wobble area than from a supported position. Wobble area is the movement of the front sight around the aiming point when the rifle is in the steadiest position. If the front sight strays from the target during the firing process, pressure on the trigger should be held constant and resumed as soon as sighting is corrected. The position must provide for the smallest possible wobble area. From a supported position, there should be minimal wobble area and little reason to detect movement. If movement of the rifle causes the front sight to leave the target, more practice is needed. The firer should never try to quickly squeeze the trigger while the sight is on the target. The best firing performance results when the trigger is squeezed continuously, and the rifle is fired without disturbing its lay.

## MALFUNCTIONS AND CORRECTIONS

Commanders and unit armorers are responsible for the organizational and direct support maintenance of weapons. Soldiers are responsible for keeping their weapons clean and operational at all times -in training and in combat. Therefore, the soldier should be issued an operator's technical manual and cleaning equipment for his assigned weapon.

### STOPPAGE

A stoppage is a failure of an automatic or semiautomatic firearm to complete the cycle of operation. The firer can apply immediate or remedial action to clear the stoppage. Some stoppages that cannot be cleared by immediate or remedial action could require weapon repair to correct the problem. A complete understanding of how the weapon functions is an integral part of applying immediate-action procedures.

**Immediate Action.** This involves quickly applying a possible correction to reduce a stoppage based on initial observation or indicators but without determining the actual cause. To apply immediate action, the soldier would perform these steps: Gently slap upward on the magazine to ensure it is fully seated, and the magazine follower is not jammed. Pull the charging handle fully to the rear and check the chamber (observe for the ejection of a live or expended cartridge). Release the charging handle (do not ride it forward). Strike the forward assist assembly to ensure bolt closure. Try to fire the rifle.

Apply immediate action only one time for a given stoppage. Do not apply immediate action a second time. If the rifle still fails to fire, inspect it to determine the cause of the stoppage or malfunction and take appropriate remedial action.

**Remedial Action.** Remedial action is the continuing effort to determine the cause for a stoppage or malfunction and to try to clear the stoppage once it has been identified.

### MAJOR CATEGORIES OF MALFUNCTIONS

A malfunction is caused by a procedural or mechanical failure of the rifle, magazine, or ammunition. Prefiring checks and serviceability inspections identify potential problems before they become malfunctions. Three primary categories of malfunctions are:

#### 1. Failure to Feed, Chamber, or Lock.

*Description.* A malfunction can occur when loading the rifle or during the cycle of operation. Once the magazine has been loaded into the rifle, the forward movement of the bolt carrier group could lack enough force (generated by the expansion of the action spring) to feed, chamber, and lock the first round. While firing, the cycle of function is interrupted by a failure to strip a round from the magazine, to chamber the round, and to lock it.

*Probable causes.* The cause could be the result of one or more of the following: excess accumulation of dirt or fouling in and around the bolt and bolt carrier, defective magazine (dented or bulged), magazine improperly loaded. A defective round (projectile forced back into the cartridge case that could result in a "stuffed round") or the base of the previous field cartridge could be separated, leaving the remainder in the chamber. Other causes could be: damaged or broken action spring, exterior accumulation of dirt in the lower receiver extension, or fouled gas tube resulting in short recoil.

*Corrective action.* Applying immediate action usually corrects the malfunction. However, to avoid the risk of further jamming, the firer should watch for ejection of a cartridge and ensure that the upper receiver is free of any loose rounds. If immediate action fails to clear the malfunction, remedial action must be taken. The carrier should not be forced. If resistance is encountered, which can occur with an unserviceable round, the bolt should be locked to the rear, magazine removed, and malfunction cleared-for example, a bolt override is when a cartridge has wedged itself between the bolt and charging handle. The best way to relieve this problem is by--

- Ensuring that the charging handle is pushed forward and locked in place.
- Holding the rifle securely and pulling the bolt to the rear until the bolt seats completely into the buffer well.
- Turning the rifle upright and allowing the overridden cartridge to fall out.

## 2. Failure to Fire Cartridge.

*Description.* Failure of a cartridge to fire despite the fact that a round has been chambered, the trigger is pulled, and the sear has released the hammer. This occurs when the firing pin fails to strike the primer with enough force or when the ammunition is bad.

*Probable causes.* Excessive carbon buildup on the firing pin is often the cause, because the full forward travel of the firing pin is restricted. However, a defective or worn firing pin can give the same results. Inspection of the ammunition could reveal a shallow indentation or no mark on the primer, indicating a firing pin problem. Cartridges that show a normal indentation on the primer but did not fire indicate bad ammunition.

*Corrective action.* If the malfunction continues, the firing pin, bolt, carrier, and locking lug recesses of the barrel extension should be inspected, and any accumulation of excessive carbon or fouling should be removed. The firing pin should also be inspected for damage. Cartridges that show a normal indentation on the primer but failed to fire could indicate a bad ammunition lot. Those that show a complete penetration of the primer by the firing pin could also indicate a bad ammunition lot or a failure of the cartridge to fully seat in the chamber.

**NOTE:** If the round is suspected to be faulty, it is reported and returned to the agency responsible for issuing ammunition

## 3. Failure to Extract and Eject.

**Failure to extract.** The cartridge must extract before it can eject.

*Description.* A failure to extract results when the cartridge case remains in the rifle chamber. While the bolt and bolt carrier could move rearward only a short distance, more commonly the bolt and bolt carrier recoil fully to the rear, leaving the cartridge case in the chamber. A live round is then forced into the base of the cartridge case as the bolt returns in the next feed cycle. This malfunction is one of the hardest to clear.

**NOTE:** Short recoil can also be caused by a fouled or obstructed gas tube.

*Probable cause.* Short recoil cycles and fouled or corroded rifle chambers are the most common causes of failures to extract. A damaged extractor or weak/broken extractor spring can also cause this malfunction.

*Corrective action.* The severity of a failure to extract determines the corrective action procedures. If the bolt has moved rearward far enough so that it strips a live round from the magazine in its forward motion, the bolt and carrier must be locked to the rear.

The magazine and all loose rounds must be removed before clearing the stoppage. Usually, tapping the butt of the rifle on a hard surface causes the cartridge to fall out of the chamber. However, if the cartridge case is ruptured, it can be seized. When this occurs, a cleaning rod can be inserted into the bore from the muzzle end. The cartridge case can be forced from the chamber by tapping the cleaning rod against the inside base of the fired cartridge. When cleaning and inspecting the mechanism and chamber reveal no defects but failures to extract persist, the extractor and extractor spring should be replaced. If the chamber surface is damaged, the entire barrel must be replaced.

**Failure to Eject.** A failure to eject a cartridge is an element in the cycle of functioning of the rifle, regardless of the mode of fire. A malfunction occurs when the cartridge is not ejected through the ejection port and either remains partly in the chamber or becomes jammed in the upper receiver as the bolt closes. When the firer initially clears the rifle, the cartridge could strike an inside surface of the receiver and bounce back into the path of the bolt.

*Probable cause.* Ejection failures are hard to diagnose but are often related to a weak or damaged extractor spring and/or ejector spring. Failures to eject can also be caused by a buildup of carbon or fouling on the ejector spring or extractor, or from short recoil. Short recoil is usually due to a buildup of fouling in the carrier mechanism or gas tube, which could result in many failures to include a failure to eject. Resistance caused by a carbon-coated or corroded chamber can impede the extraction, and then the ejection of a cartridge.

*Corrective action.* While retraction of the charging handle usually frees the cartridge and permits removal, the charging handle must not be released until the position of the next live round is determined. If another live round has been sufficiently stripped from the magazine or remains in the chamber, then the magazine and all live rounds could also require removal before the charging handle can be released. If several malfunctions occur and are not corrected by cleaning and lubricating, the ejector spring, extractor spring, and extractor should be replaced.



## OTHER MALFUNCTIONS

Some other malfunctions that can occur are as follows.

- Failure of the bolt to remain in a rearward position after the last round in the magazine is fired. Check for a bad magazine or short recoil.
- Failure of the bolt to lock in the rearward position when the bolt catch has been engaged. Check bolt catch; replace as required.
- Firing two or more rounds when the trigger is pulled and the selection lever is in the SEMI position. This indicates a worn sear, cam, or disconnect. Turn in to armorer to repair and replace trigger group parts as required.
- Trigger will not pull or return after release with the selector set in a firing position. This indicates that the trigger pin has backed out of the receiver or the hammer spring is broken. Turn in to armorer to replace or repair.
- Failure of the magazine to lock into the rifle. Check the magazine and check magazine catch for damage. Turn in to armorer to adjust the catch; replace as required.
- Failure of any part of the bolt carrier group to function. Check for incorrect assembly of components. Correctly clean and assemble the bolt carrier group, or replace damaged parts.
- Failure of the ammunition to feed from the magazine. Check for damaged magazine. A damaged magazine could cause repeated feeding failures and should be turned in to armorer or exchanged.

**NOTE:** Additional technical information on troubleshooting malfunctions and repairing components is contained in the organizational and DS maintenance publications and manuals.

## INSTRUCTOR/TRAINER SELECTION

Institutional and unit instructors/trainers are selected and assigned from the most highly qualified soldiers. These soldiers must have an impressive background in rifle marksmanship; be proficient in applying these fundamentals; know the importance of marksmanship training; and have a competent and professional attitude. The commander must ensure that selected instructors/trainers can effectively train other soldiers. Local instructor/trainer training courses and marksmanship certification programs must be established to ensure that instructor/trainer skills are developed.

Cadre/trainer refers to a marksmanship instructor/trainer that has more experience and expertise than the firer. He trains soldiers in the effective use of the rifle by maintaining strict discipline on the firing line, insisting on compliance with range procedures and program objectives, and enforcing safety regulations. A good instructor/trainer must understand the training phases and techniques for developing marksmanship skills, and he must possess the following qualifications:

**Knowledge.** The main qualifications for an effective instructor/trainer are thorough knowledge of the rifle, proficiency in firing, and understanding supporting marksmanship manuals.

**Patience.** The instructor/trainer must relate to the soldier calmly, persistently, and patiently.

**Understanding.** The instructor/trainer can enhance success and understanding by emphasizing close observance of rules and instructions.

**Consideration.** Most soldiers enjoy firing regardless of their performance and begin with great enthusiasm. The instructor/trainer can enhance this enthusiasm by being considerate of his soldiers feelings and by encouraging firing abilities throughout training, which can also make teaching a rewarding experience.

**Respect.** An experienced cadre is assigned the duties of instructor/trainer, which classifies him as a technical expert and authority. The good instructor/trainer is alert for mistakes and patiently makes needed corrections.

**Encouragement.** The instructor/trainer can encourage his soldiers by convincing them to achieve good firing performance through practice. His job is to impart knowledge and to assist the soldier so he can gain the practical experience needed to become a good firer.

## **DUTIES OF THE INSTRUCTOR/TRAINER**

The instructor/trainer helps the firer master the fundamentals of rifle marksmanship. He ensures that the firer consistently applies what he has learned. Then, it is a matter of practice, and the firer soon acquires good firing skills. When training the beginner, the instructor/trainer could confront problems such as fear, nervousness, forgetfulness, failure to understand, and a lack of coordination or determination. An expert firer is often unaware that some problems are complicated by arrogance and carelessness. With all types of firers, the instructor/trainer must ensure that firers are aware of their firing errors, understand the causes, and apply remedies. Sometimes errors are not evident. The instructor/trainer must isolate errors, explain them, and help the firer concentrate on correcting them.

**Observing the Firer.** The instructor/trainer observes the firer during drills and in the act of firing to pinpoint errors. If there is no indication of probable error, then the firer's position, breath control, shot anticipation, and trigger squeeze are closely observed.

**Questioning the Firer.** The firer is asked to detect his errors and to explain his firing procedure to include position, aiming, breath control, and trigger squeeze.

**Analyzing the Shot Group.** This is an important step in detecting and correcting errors. When analyzing a target, the instructor/trainer critiques and correlates observations of the firer to probable errors in performance, according to the shape and size of shot groups. A poor shot group is usually caused by more than one observable error.

## CONDUCT OF TRAINING

In the conduct of marksmanship training, the instructor/trainer first discusses an overview of the program to include the progression and step-by-step process in developing firing skills. (This can be accomplished by showing Once the soldier realizes the tasks and skills involved, he is ready to begin. He receives preliminary rifle instruction before firing any course. Also during this initial phase, an understanding of the service rifle develops through review.

## MECHANICAL TRAINING

Mechanical training includes characteristics and capabilities, disassembly and assembly, operations and functioning, serviceability checks, and weapons maintenance. It also stresses the performance of immediate action to clear or reduce a stoppage, and the safe handling of rifles and ammunition. Examples of mechanical training drills, along with tasks, conditions, and standards, are provided in. These examples are also used for initial entry training at the Army training centers. Mechanical training must encompass all related tasks contained in the soldier's manual of common tasks (SMCT) to include the correct procedures for disassembly, cleaning, inspection, and reassembly of the rifle and magazine.

Serviceability inspections and preventive maintenance checks must be practiced to ensure soldiers have reliable weapons systems during training and in combat. Technical information necessary to conduct mechanical training is contained in the soldier's operator's manual (M16A1 - [TM 9-1005-249-10](#); M16A2 - [TM 9-1005-319-10](#)). Once the basic procedures have been demonstrated, soldiers should practice the mechanical training skills under varied conditions to include during nighttime, and in MOPP and arctic clothing.

As part of mechanical training, soldiers must be taught and must practice procedures for properly loading ammunition into magazines to include both single loose rounds and speed loading of 10-round clips.

Emphasis on maintenance and understanding of the rifle can prevent most problems and malfunctions. However, a soldier could encounter a stoppage or malfunction. The soldier must quickly correct the problem by applying immediate action and continue to place effective fire on the target.

**Immediate-action procedures** contained in [Chapter 2](#) and the operator's technical manual should be taught and practiced as part of preliminary dry-fire exercises, and should be reinforced during live-fire exercises.

**Immediate-action drills** should be conducted using dummy ammunition (M199) loaded into the magazine. The soldier chamber the first dummy round and assume a firing position. When he squeezes the trigger and the hammer falls with no recoil, this is the cue to apply the correct immediate-action procedure and to refire. Drill should continue until soldiers can perform the task in three to five seconds.

The word **SPORTS** is a technique for assisting the soldier in learning the proper procedures for applying immediate action to the M16A1 and M16A2 rifles.

First, **THINK**, then:

**S**lap up on the bottom of the magazine.

**P**ull the charging handle to the rear.

**O**bserve the chamber for an ejection of the round.

**R**elease the charging handle.

**T**ap the forward assist.

**S**queeze the trigger again.

**NOTE:** When slapping up on the magazine, be careful not to knock a round out of the magazine onto the line of the bolt carrier, causing more problems. Slap hard enough only to ensure the magazine is fully seated.

## **CONDUCT OF DRY-FIRE TRAINING**

A skilled instructor/trainer should supervise soldiers on dry-fire training. Once an explanation and demonstration are provided, soldiers should be allowed to work at their own pace, receiving assistance as needed. The peer coach-and-pupil technique can be effectively used during dry-fire training with the coach observing performance and offering suggestions. Several training aids are available to correctly conduct initial dry-fire training of the four fundamentals. A supported firing position should be used to begin dry-fire training. Sandbags and chest-high support are used to effectively teach this position. While any targets at any range can be used, the primary aim point should be a standard silhouette zeroing target placed at a distance of 25 meters from the firing position. The other scaled-silhouette targets - slow fire and timed fire - are also excellent for advanced dry-fire training.

After the soldier understands and has practiced the four fundamentals, he proceeds to integrated dry-fire exercises. The objective of integrated dry fire is to master the four fundamentals of Marksmanship in a complete firing environment. With proper dry-fire training, a soldier can assume a good, comfortable, steady firing position when he moves to the firing line. He must understand the aiming process, breath control is second nature, and correct trigger squeeze has been practiced many times. Also, by adding dummy ammunition to the soldier's magazine, other skills can be integrated into the dry-fire exercise to include practicing loading and unloading, reinforcing immediate-action drills, and using the dime (washer) exercise.

When correctly integrated, dry fire is an effective procedure to use before firing live bullets for grouping and zeroing, scaled silhouettes, field firing, or practice record fire. It can be used for remedial training or opportunity training, or as a primary training technique to maintain marksmanship proficiency.

## **TOWER COMMANDS**

- 1) IS THERE ANYONE DOWN RANGE? IS THERE ANYONE DOWN RANGE? THE RANGE IS NO LONGER CLEAR.
- 2) FIRERS, STAND BEHIND YOUR FIGHTING POSITION.
- 3) FIRERS, GET INTO THE FIGHTING POSITION.
- 4) WATCH YOUR LANE AND IDENTIFY THE TARGETS IN YOUR LANE.  
(RAISE ALL TARGETS)
- 5) FIRERS, ASSUME A GOOD SUPPORTED FIRING POSITION.
- 6) COACHES, ISSUE THE FIRER A 20 ROUND MAGAZINE.
- 7) LOCK AND LOAD ONE 20 ROUND MAGAZINE.
- 8) IS THE FIRING LINE CLEAR ON THE LEFT?
- 9) IS THE FIRING LINE CLEAR IN THE CENTER?
- 10) IS THE FIRING LINE CLEAR ON THE RIGHT?
- 11) THE FIRING LINE IS NOW CLEAR.
- 12) FIRERS, ROTATE YOUR SELECTOR LEVEL FROM SAFE TO SEMI, AND WATCH YOUR LANE.
- 13) CEASE FIRE, CEASE FIRE, CEASE FIRE.
- 14) SAFETIES, ENSURE THE BOLTS ARE LOCKED TO THE REAR, THE WEAPON IS CLEARED AND PLACED ON SAFE.
- 15) PLACE YOUR WEAPON IN THE V-NOTCH STAKE.
- 16) FIRERS, EXIT TO THE REAR OF THE FIGHTING POSITION.
- 17) FIRERS, ASSUME A GOOD UNSUPPORTED FIRING POSITION.
- 18) IS THE FIRING LINE CLEAR ON THE LEFT?
- 19) IS THE FIRING LINE CLEAR IN THE CENTER?
- 20) IS THE FIRING LINE CLEAR ON THE RIGHT?
- 21) THE FIRING LINE IS NO LONGER CLEAR.
- 22) COACHES, ISSUE THE FIRER ONE 20 ROUND MAGAZINE.
- 23) FIRERS, LOCK AND LOAD ONE 20 ROUND MAGAZINE.
- 24) FIRERS, ROTATE YOUR SELECTOR LEVEL FROM SAFE TO SEMI, AND WATCH YOUR LANE.
- 25) CEASE FIRE, CEASE FIRE, CEASE FIRE.
- 26) LOCK AND CLEAR ALL WEAPONS AND PLACE THEM IN THE V-NOTCH STAKE.
- 27) SAFETIES, ENSURE THE BOLTS ARE LOCKED TO THE REAR, THE WAEPON IS CLEARED AND PLACED ON SAFE.

DEPARTMENT OF THE ARMY  
HEADQUARTERS, UNITED STATES ARMY TRAINING AND DOCTRINE COMMAND  
Fort Monroe, Virginia 23651-5000

TRADOC Regulation  
No. 350-29

31 December 1987

Training  
PREVENTION OF HEAT AND COLD CASUALTIES

Supplementation of this regulation is permitted.  
However, proposed supplements must be submitted  
to HQ TRADOC, ATTN: ATTG-I, for approval.

	Paragraph	Page
Purpose .....	1	1
Applicability .....	2	1
Responsibility .....	3	1
General .....	4	1
Recognition and treatment .....	5	2
Heat injury prevention .....	6	4
Cold injury prevention .....	7	7
Evacuation .....	8	9
Reporting .....	9	9
References .....	10	9
 APPENDIX A. SAMPLE HEAT INJURY PREVENTION CARD.....		A-1
B. SAMPLE COLD INJURY PREVENTION CARD.....		B-1
C. SAMPLE WIND CHILL CARD.....		C-1

1. Purpose. To prescribe policy and provide guidance to assist commanders in preventing heat and cold injuries.

2. Applicability. This regulation applies to all Active Component (AC) and Reserve Component (RC) training conducted at service schools, Army training centers (ATC), or other training activities under the control of HQ TRADOC,

3. Responsibility. Commanders and supervisors at all levels are responsible for protecting soldiers and civilian personnel from heat and cold injury,

4. General. Extremes in weather conditions pose additional problems to our training efforts and increase the risk of heat and cold injury, Successfully preventing climatic casualties depends largely on educating personnel and applying methods to reduce exposure. Additionally, to prevent heat and cold

injuries, commanders must develop procedures to alert individuals of heat stress and windchill conditions and adopt techniques to reduce the susceptibility of personnel to climatic injury.

5. Recognition and treatment. Commanders and supervisors must ensure every individual who may be exposed to unaccustomed environmental conditions is informed of the potentially serious results of climatic injuries and how to recognize and treat those injuries if they occur. The U.S. Army Training and Audiovisual Support Center (TASC) has available for use pocket-size guides for identification, first aid treatment, and preventive measures for heat (GTA 8-5-45 (appendix A)) and cold (GTA 8-6-12 (appendix B)) injuries.

a. Heat injuries that commanders should be particularly concerned with include heat cramps, heat exhaustion, and heat stroke. The symptoms and treatments for these heat injuries are listed below.

(1) Heat cramps. Heat cramps result primarily from excessive loss of salt from the body. This condition occurs when individuals who have been actively sweating don't replace the salt lost in their sweat.

(a) Symptoms. Painful contraction of muscles (normally the extremities and abdominal muscles). Body temperature is normal unless heat cramps are accompanied by heat exhaustion.

(b) Treatment. Heat cramps are promptly relieved by replacing the salt lost from the body. Move victims to a shaded area, loosen their clothing, and make them slowly drink at least one canteen of salted water (1/4 teaspoon of salt per quart of water). If salt is not available, use plain water.

(2) Heat exhaustion. Heat exhaustion occurs as a result of excessive loss of water and salt from the body.

(a) Symptoms. Profuse sweating, headache, tingling sensations, paleness of skin, shortness of breath, palpitations, trembling, nausea, and vomiting. The skin will be moist and cool; the pulse will be rapid; and the body temperature will be normal or slightly below normal. Individuals with heat exhaustion may also act slightly confused or may momentarily lose consciousness.

(b) Treatment. Move victims of heat exhaustion to a shaded area, loosen their clothing, and elevate their feet to promote the return of blood to their heart. Make them drink at least one canteen of salted water (1/4 teaspoon of salt per quart of water). Recovery is usually prompt. However, individuals suffering from heat exhaustion will be assigned to light duty for 24 to 48 hours following their recovery.



(3) Heat stroke. HEAT STROKE IS A MEDICAL EMERGENCY WITH A HIGH MORTALITY RATE. This condition, caused by overexposure to the sun or heat, results from a breakdown of the body's ability to control its temperature.

(a) Symptoms. Extremely high body temperature, sudden loss of consciousness, convulsions, delirium, headache, dizziness, weakness, and nausea. Sweating is absent in the typical case, and the skin is hot, dry, and flushed. Pulse and respiration are rapid.

(b) Treatment. Lowering the victim's body temperature as rapidly as possible is the most important objective in the treatment of heat strokes. Remove the patient's clothes, and, if any source of cool water or ice is nearby, immerse the victim in it. Otherwise, sprinkle water over the patient and fan the patient to hasten the water evaporation. Transport victims of heat stroke to the nearest medical facility as soon as possible. While awaiting transportation, keep patients in the shade with their feet elevated. If they are conscious, make them drink at least one canteen of salted water (1/4 teaspoon of salt per quart of water). Continue efforts to reduce body temperature while transporting victims.

b. Cold injuries are classified as nonfreezing (trench/immersion foot/ and hypothermia) and freezing (frostbite). Symptoms and treatments for cold injuries are listed below.

(1) Trench/immersion foot. Immersion foot or trench foot is an injury that results from fairly long exposure of the feet to wet conditions at temperatures from approximately 50 to 32 degrees fahrenheit. Inactive feet in wet socks and boots or tightly laced boots impair circulation and are even more susceptible to injury. Prolonged exposure can cause the feet to swell. Pressure closes blood vessels, cuts off circulation, and can lead to loss of parts of the feet.

(a) Symptoms. Feet are cold and reddish in color and have swelling, blistering, bleeding, and numbness.

(b) Treatment. Individuals with immersion injury should elevate and rewarm their feet gradually by exposing them to warm air. Do not moisten, massage, or apply heat or ice to feet with immersion injuries. Covering the patient with several layers of warm coverings is preferable to using extreme heat. Evacuate patients as soon as possible.

(2) Hypothermia. Hypothermia is a state in which core body temperatures of individuals are below normal because they are losing heat faster than they can produce it. General cooling of the entire body to a temperature below 95 degrees fahrenheit is caused by continued exposure to low or rapidly dropping temperatures, cold moisture, snow, or ice.

(a) Symptoms. As the body cools, the following progressive

stages of discomfort and impairment occur: shivering; faint pulse; mental confusion; slurred speech; glossy eyes; slow, shallow breathing; uncoordinated movements; unconsciousness; and irregular heart beat.

(b) Treatment. Since hypothermia is a medical emergency, prompt medical treatment is necessary. The victim's body must be rewarmed with an external heat source since the victim can't generate heat. Perform cardiopulmonary resuscitation (CPR), if necessary, and keep the victim dry and protected from the elements. Evacuate the victim as soon as possible.

(3) Frostbite. Frostbite is the injury to tissue caused from exposure to below freezing temperatures. Severe frostbite can result in loss of affected body parts such as fingers, toes, hands, or feet.

(a) Symptoms. Frostbite starts with a discoloration of the skin of the nose, ears, cheeks, fingers, or toes. This is followed by a tingling sensation for a short time and then numbness. The skin may briefly appear red for light skinned individuals or greyish for dark skinned individuals and then become pale or waxy white. Upon thawing, the signs vary with the degree of injury. Mild to moderate frostbite injury appears red and swollen, has blisters, and is painful. Severe frostbite injuries have blue-black discoloration, blood filled blisters, and an absence of pain.

(b) Treatment. Remove tight clothing or boots from the injured area. Warm the frozen body part by placing it next to the skin of another person. Keep the victim warm and covered to prevent further injury. Do not massage, expose to open fire, rub with snow, or soak injuries in cold water. Evacuate the victim to a medical treatment facility as soon as possible.

## 6. Heat injury prevention.

a. Reference 10e contains a comprehensive discussion of heat casualty prevention. Commanders, cadre, and other responsible officers and non-commissioned officers (NCO) must be able to identify environmental conditions under which adverse effects of heat are likely to occur. The Wet Bulb Globe Temperature (WBGT) Index and the Wet Globe Thermometer (WGT) are the best means of evaluating the degree of heat stress imposed by all environments. Commanders must use at least one of these indexes during all operations in heat and take measurements in a location which is the same as, or closely approximates, the environment to which personnel are exposed.

b. Heat conditions are classified by color (green, yellow, red, and black; in increasing order of heat stress according to Botsball (WGT) and WBGT readings. Commanders must adapt training/physical activity and uniform requirements to conform with the precautions for each heat condition listed on next page.

HEAT	BOTSBALL (WGT)	WBGT	WATER INTAKE	**ACCLI- MATIZED
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CONDITION	INDEX F	INDEX F	QTS/HR	WORK/REST	UNACCLIMATIZED
*	<80	<82	1/2	50/10	Use caution in planning extremely intense physical exertion.
GREEN	80-82.9	82-84.9	1/2 to 1	50/10	Use discretion in planning heavy exercise.
YELLOW	83-85.9	85-87.9	1 to 1 ½	45/15	Suspend strenuous exercise during the first 3 weeks of training. Activities may be continued on a reduced scale after the 2d week. Avoid activity in the direct sun.
RED	86-87.9	88-89.9	1 1/2 to 2	30/30	Curtail strenuous exercise for all personnel with less than 12 weeks of hot weather training.
BLACK	88 & up	90 & up	>2	20/40	Suspend physical training and strenuous exercise. Essential operational commitments (e.g., guard duty) will not be suspended.

\* Mission Oriented Protective Posture (MOPP) or body armor adds 10 degrees fahrenheit to the Botsball or WBGT index.

\*\* An acclimatized soldier is one who has had progressive degrees of heat exposure and physical exertion for about 2 weeks. These work/rest periods do not apply to soldiers in MOPP gear or body armor.

c. The following actions, if emphasized by the commander, will reduce the risk of heat injury:

(1) Training. Give classes on heat injury recognition, treatment, and preventive measures annually to cadre and to soldiers in training. These classes will stress the causes of heat injury, the potentially serious result, first aid treatments, and the importance of water consumption in preventing heat injury. Briefings for commanders and supervisors will also include discussions on the following topics:

TRADOC Reg 350-29

(a) Past experience with heat injury at the installation.

(b) The need for acclimatization and careful scheduling of

physical activities.

(c) The recognition of personnel who are at increased risk of heat injury (e.g., those with prior heat injury, current illness, recent immunization, obesity, and those who take medication).

(d) Use of the WBGT and WGT indexes.

(2) Use of the buddy system. Soldiers do not always recognize or react to their own early symptoms of heat injuries. They must be taught to observe their buddies for evidence of heat stress.

(3) Acclimatization to heat. Acclimatization is acquired by working in hot environments for gradually increasing periods of time on a daily basis over a period of about 2 weeks. Schedule training programs to provide for increasingly longer periods with alternating rest periods for personnel who are climatically unseasoned to heat. Commanders must take advantage of the cooler hours of the day when it is necessary to accomplish work during the acclimatization period.

(4) Water intake. Adequate water intake is the single most important factor in avoiding heat injury. An individual subjected to high heat stress may, through sweating, lose water in excess of one quart per hour. Water loss must be replaced, preferably by periodic intake of small amounts of water throughout the work period. Thirst is not an adequate stimulus for water intake. Therefore, commanders must require soldiers to drink water to prevent dehydration. Commanders must enforce an unlimited water drinking policy, particularly during times of increased physical stress.

(5) Salt replacement. In addition to water, sodium chloride is lost in sweating. While the diet ordinarily contains an adequate amount of salt, additional salt may be provided cautiously during the first few days of exposure to heat, especially in the case of unacclimatized individuals. Salt loss tends to be greater during acclimatization than after acclimatization. Using extra salt in cooking and on the plate will meet most requirements. Avoid excessive intake of salt, since it may cause increased thirst and incapacitating nausea.

(6) Scheduling work/training. Commanders must schedule activities to fit the climate, the physical condition of personnel, and the military situation. Schedule intense physical activity during the cooler hours of the day and avoid scheduling work in direct sunlight on hot days when possible. Commanders must closely supervise their soldiers to complete training requirements with minimum hazard.

(7) Physical conditioning. The general physical condition of the individual has a significant bearing on the reaction to heat stress. The risk

of heat injury is much higher in overweight, unfit persons than in those of normal weight. Commanders must exercise special care where such persons are exposed to high temperatures. Since one attack of either heat stroke or severe heat exhaustion may predispose to a second, commanders must identify individuals who have experienced previous heat injury and exercise caution in exposing them to subsequent heat stress.

(8) Clothing. Clothing reduces the exposure of the body surface to solar radiation; however, at the same time, it decreases the movement of air over the skin. To take full advantage of its benefits and minimize its disadvantages, clothing should be loose fitting, especially at the neck and wrists. Commanders may authorize exceptions to the prescribed wear of the Battle Dress Uniform (BDU) to protect troops and maintain efficiency. During heat condition "yellow," commanders will have soldiers unblouse trousers during strenuous physical activity or exposure to heat. Commanders will require soldiers to remove their jackets during strenuous physical activity or exposure to heat in heat categories "red" and "black." However, commanders must avoid exposing soldiers to intense solar radiation for extended periods of time (>1 hour).

d. Do not use water sprays to cool down soldiers in training (except as a first aid treatment for heat stroke casualties). This does not prevent heat injuries. The temporary cooling effect achieved through spraying may in fact increase core body temperature and intensify heat injuries.

#### 7. Cold injury prevention.

a. Prior planning and adequate training are essential to minimize cold injury casualties. Reference 10d contains a detailed discussion on proper measures for preventing cold injuries. Commanders, cadre, and other responsible officers and NCOs must be familiar with environmental conditions (such as temperature, wind, humidity, and ground surface conditions) that influence the risk of cold injury. They should know how to use the wind chill chart in table 1 of reference 10d. A pocket size wind chill card (GTA 8-5-40 (appendix C)) is available for use through TASC.

b. Commanders must establish appropriate guidelines on training/physical activity, uniform wear, and troop support requirements to conform with the precautions for each wind chill level listed below.

#### WIND CHILL (Degrees Fahrenheit)

#### PRECAUTIONS

30 and below

Alert personnel to the potential for cold injury.

7

TRADOC Reg 350-29

#### WIND CHILL (Degrees Fahrenheit)

#### PRECAUTIONS

25 and below

Leaders inspect personnel for wear of cold weather clothing.

	Provide warm-up tents/areas and hot beverages.
0 and below	Leaders inspect personnel for cold injuries and emphasize that buddies must also check each other.
	Increase the frequency of rotating soldiers exposed to wind chill conditions to warming area.
-20 and below	Curtail all but mission essential operations where soldiers are exposed to wind chill conditions.

c. Effective cold injury prevention programs must include the following:

(1) Training. Give classes on cold injury recognition, first aid, and preventive measures annually to all cadre and soldiers in training.

(2) Use of the buddy system. Soldiers do not always recognize or react to their own early symptoms of cold injuries. They must be taught to observe their buddies for evidence of overexposure to cold.

(3) Clothing. The chain of command must ensure that soldiers are issued serviceable, properly fitting clothing and footgear for cold weather. Additionally, commanders must emphasize that preventing cold injuries depends on wearing clothing properly. Soldiers should be encouraged to wear as little as possible, consistent with the weather. (It is better for the body to be slightly cold and generating heat than excessively warm.) Clothing should be clean, dry, loose fitting, and worn in layers. Layering clothing provides layers of air to insulate the body and permits good circulation of the blood. Dirty clothes conduct heat more rapidly and afford less protection from the cold. Moisture causes clothing and footgear to lose their insulating qualities. Encourage soldiers to remove some layers when they are exposed to heat or performing any physical activity to prevent perspiration and subsequent chilling.

(4) Scheduling work/training. Commanders must tailor schedules to fit weather conditions by scheduling activities requiring exposure to cold as the wind chill factor increases and frequently providing warm-up breaks.

TRADOC Reg 350-29

(5) Physical conditioning. The general physical condition of soldiers has a significant bearing on their susceptibility to cold injury.. Physical fatigue contributes to apathy, inactivity, personal neglect, and carelessness. These lead to loss of heat production and retention and increase the risk of cold injury. Soldiers with prior cold injuries have a higher than normal risk of subsequent cold injuries. Commanders must ensure soldiers maintain their

self-discipline in cold weather to protect themselves from cold injury, Additionally, commanders must identify soldiers with previous cold injuries and exercise caution in exposing them to hazardous wind chill conditions.

(6) Exercise. Commanders must encourage physical activity in cold weather, Activity of large muscle groups of the shoulders, trunk, and legs is required in order to generate and maintain body heat. When the situation prohibits such gross activities, frequent changes of positions; moving toes, feet, legs, fingers, arms, and hands; and, to a lesser extent, isometric contractions are less satisfactory alternatives. In such situations, some delay in heat loss can be accomplished by sitting or standing on insulating material rather than on cold or wet ground.

8. Evacuation. Commanders must establish a liberal policy of evacuation of injured personnel to the nearest medical treatment facility.

9. Reporting. In accordance with AR 40-400, commanders will use the Special Telegraphic Report RCS MED-16(R4) to report all heat and cold injuries requiring hospital admission or any significant clusters of heat or cold injuries that occur in one unit that do not require hospitalization. Commanders must furnish a copy of this report to Commander, TRADOC, ATTN: ATMD, Fort Monroe, VA 23651-5000.

10 . References.

- a. Army Regulation 40-5, 1 Jun 85, Preventive Medicine.
- b. Field Manual 21-10, 22 Dec 83, Field Hygiene and Sanitation.
- c. Field Manual 21-11, 7 Oct 85, First Aid for Soldiers.
- d. TB Med 81, 30 Sep 76, Cold Injury.
- e. TB Med 507, 25 Jul 80, Occupational and Environmental Health: Prevention, Treatment, and Control of Heat Injury.
- f. TRADOC Regulation 350-6, 13 Feb 87, Initial Entry Training Policies and Administration, 13 Feb 87.

TRADOC Reg 350-29

## APPENDIX A

### SAMPLE HEAT INJURY PREVENTION CARD

**HEAT CRAMPS**

**BASIC HEAT INJURY PREVENTION**

#### SYMPTOMS

Muscle cramps of the abdomen, legs or arms.

#### FIRST AID

1. Move the soldier to a shaded area and loosen clothing.
2. Dissolve ¼ teaspoon table salt in a (one quart) canteen of water. Have soldier slowly drink at least one canteen of this salt solution. If no salt is available, use plain water. DO NOT USE ADDITIONAL SALT.

1. Consider water a tactical weapon. Reduce heat injury by forcing water consumption.
2. When possible, provide cooled water (50F to 60F) to enhance its taste and increase voluntary water consumption.
3. Drink one quart of water in the morning, at each meal, and before and during hard or strenuous work.
4. Take frequent drinks since they are more effective than drinking the same amount all at once. Larger soldiers need more water.
5. The use of salt tablets for replacement of salt lost through sweating is not recommended. An adequate salt intake is best achieved by eating three salt-seasoned meals per day.
6. When possible, schedule heavy workloads for the cooler hours of the day such as early morning or late evening.
7. Give frequent rest periods. Lower the workrate and workloads as the heat condition increases.
8. When possible, workloads and/or duration of physical exertion should be less during the first days of exposure to heat: then they should be gradually increase to allow acclimatization.

### HEAT EXHAUSTION

#### SYMPTOMS

Profuse sweating with pale, moist and cool skin, headaches, weakness, loss of appetite, dizziness. May also have heat cramps, nausea, urge to defecate, chills, rapid breathing, tingling of the hands or feet and confusion.

#### FIRST AID

1. Move soldier to a shaded area, loosen or remove clothing; elevate legs, pour on water and fan if it is very hot.
2. Dissolve ¼ teaspoon table salt in a (one quart) canteen of water. Have the soldier slowly drink at least one canteen of this salt solution. If no salt is available, use plain water. DO NOT USE ADDITIONAL SALT.

### HEATSTROKE

#### SYMPTOMS

Headache, dizziness, stomach pains, confusion, weakness, may Suddenly lose consciousness, and may have seizures; skin is hot and may be dry; pulse and respiration are rapid and weak. Heatstroke is a medical emergency.

#### FIRST AID

1. Immerse in water or pour water on and fan.
2. Transport to the nearest medical treatment facility at once.
3. While awaiting or during transport move to a shaded area, remove clothing and boots, elevate legs; continue pouring on water and fanning; massage the skin. If conscious, have him drink the salt water as described under Heat Exhaustion. DO NOT USE ADDITIONAL SALT.

## APPENDIX B

### SAMPLE COLD INJURY PREVENTION CARD

GTA 8-6-12  
AUGUST 1985

#### ADVERSE EFFECTS OF COLD CAUSE AND SYMPTOMS

##### **FREEZING INJURY (FROSTBITE).**

- a. Cause: EXPOSURE TO BELOW FREEZING TEMPERATURES,



COMMONLY ASSOCIATED WITH DAMP CLOTHING OVER THE INVOLVED BODY PART.

b. Symptoms: Skin is waxy, white/gray and numb while frozen. Upon thawing, the signs vary with the degree of injury as follows:

1. Mild-Moderate: Redness, swelling, clear blisters, pain.
2. Severe: Blue-black discoloration, blood-filled blisters, early absence of pain.

**NONFREEZING ("TRENCH FOOT," "IMMERSION FOOT").**

a. Cause: PROLONGED EXPOSURE TO COLD (USUALLY 32o -50o F) AND WETNESS.

b. Symptoms: Redness, swelling, blistering, bleeding, numbness.

SEE REVERSE FOR PREVENTION AND FIRST AID

HEADQUARTERS, DEPARTMENT OF THE ARMY

**PREVENTION**

**TO KEEP WARM REMEMBER THE WORD C-O-L-D**

**C – Cleanliness and Care** – Feet, socks, and clothing are warmer when clean. Proper care of the feet is imperative.

**O -- Overheating** – Wearing too much clothing causes overheating, perspiration, dampness and coldness.

**L -- Layers and Looseness** – Clothing in loose layers assures air spaces which hold body heat. Adjust the number of layers to the temperature and activity. Loose-fitting clothing insures circulation and insulation.

**D -- DAMPNESS** – A wet garment is a cold garment. Wear the field jacket as a windbreaker and to repel water.

**FIRST AID TREATMENT**

Get off your feet, change to warm, dry clothing, and seek medical assistance. DO NOT RUB, AND DO NOT USE SNOW.

**SEE REVERSE FOR CAUSE AND SYMPTOMS**

DISTRIBUTION: US Army Training and Audiovisual Support Center (TASC).

B-1

TRADOC Reg 350-29

**APPENDIX C  
SAMPLE WIND CHILL CARD**

**HOW TO USE THE WIND CHILL CHART**

Find the windspeed in the left-hand column, then read across to the column under the actual temperature. This number is the equivalent temperature which would be acting on any exposed skin. For example, if the wind is

blowing at 20 mph (32 kph) and the actual temperature is 10° F (-12° C), the effect on bare skin would be the same as a temperature reading of -25° F (-32° C) under calm conditions. Any movement has the same cooling effect as the wind. Running, skiing, or riding in an open vehicle must be considered in using the wind chill chart.

\* GPO : 1983 0 - 417-503

The proponent for this regulation is the Office of the Deputy Chief of Staff for Training. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications) through channels to Cdr, TRADOC, ATTN: ATTG-I, Fort Monroe, VA 23651-5000.

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Chief of Staff



THEODORE W. HUMMEL  
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# Mission Risk Assessment Worksheet

## EXAMPLE

Page 1 of 1

<b>1. Unit:</b>	<b>2. Prepared by:</b> (Rank/Last name/Duty Position)		<b>3. DTG Prepared:</b>			
<b>4. Mission/Task:</b>	<b>5. DTG Begin</b> <b>DTG End:</b>					
<b>6. Leader Task (If applicable):</b>						
<b>7. Individual Task (If applicable):</b>						
8. Hazards	9. Initial Risk Level*	10. Controls	11. Residual Risk Level*	14. How to Implement	15. How to Supervise	16. Controls Effective ?
Soldier not familiar with task.		Prior task training on weapons and range operations. Safety briefing prior and at training site.		Sop's, Rehearsals, AR 385-63 USASC&FG 210-21	Commander, OIC/RSO	
Soldier may become disoriented to their sector of fire.		OIC/RSO will place each soldier on the firing line and ensure each soldier knows his or her sector of fire.		Sop's, Rehearsals, AR 385-63 USASC&FG 210-21	OIC/RSO	
Soldiers may lose their footing while moving on or off the firing.		Soldiers will rehearse movement on and off range, be briefed to move carefully, and be lead on and off range by the RSO. Leaders will recon range prior to occupying.		Sop's, Rehearsals, AR 385-63 USASC&FG 210-21	OIC RSO	
Weapons not being cleared as soldiers move off firing line		RSO will inspect all weapons prior to soldier moving off firing line.		Sop's Rehearsal USASC&FG 210-21	OIC RSO	
Clearing malfunctions and stoppages by soldiers		Soldier will perform immediate action to clear stoppage. RSO will be on site to handle major malfunctions.		Same as above	Same as above	
Removal of brass or live rounds from range by soldiers in training		All soldiers will be inspected prior to moving off range.		Same as above	Same as above	
<b>12. Overall risk level after controls are implemented (Circle one or High Light)</b>			<b>13. Risk Decision Authority:</b> (Rank/Last Name/Duty Position)			<b>DTG and Signature</b>
<b>LOW</b>	<b><u>MODERATE</u></b>	<b>HIGH</b>	<b>EXTREMELY HIGH</b>			

## Fort Gordon Range Operations Unit OIC/RSO Checklist

### RANGE SCHEDULING & PLANNING

- ☐ Contact your Bn S3 / training NCO and confirm: **(1)** Range location, **(2)** Weapon system, **(3)** Munitions type, **(4)** Firing hours, and **(5)** Range Contract (control) Number. **RFMSS Scheduling Office and info:** **791-5005/5008**
- ☐ Obtain and review **FM's** and **TM's** on weapon systems to be supervised.
- ☐ Arrange for Combat Lifesaver (.50 cal and below), emergency vehicle w/ litter.
- ☐ **All Ranges require one certified (E7 or above for OIC duties), one certified E6 or above for RSO duties. Non-certified (E4 CPL or above) Line Safety NCOs.**
- ☐ Review **AR 385-63, Chapter 4**, Range Safety Duties and responsibilities for OIC / RSO / NCOIC, FG Regulation 210-21 section 2.
- ☐ Ensure that ammunition NCO orders and draws correct types of ammunition for your range. **Ensure that RFMSS reflects correct ammo type.**

### RANGE RECON & CHECK-IN – AT LEAST ONE DAY PRIOR TO TRAINING

#### EVENT

- ☐ Recons will be coordinated at least 24 hours prior to the range.
- ☐ OIC, RSO, and Medic will jointly check-in with Range Control on the day of range.
- ☐ Read and research **(1)** Local range SOP.
- ☐ Do the following: **(1)** Conduct recon of range, training area and billeting facilities, **(2)** Request fire hazard conditions, **(3)** Confirm tracer usage, and authority to use pyrotechnics [CS gas] with Range Control, **(4)** Sign for Fire barrels.
- ☐ Sign for range, training area, and facilities. Make final coordination for any special targetry or other special needs.
- ☐ **Special Targetry Scenarios** require check-in and coordination at least 45 days in advance. Will target carpentry work be required?

### BEFORE DEPARTING FOR RANGE

- ☐ Test your SINGARS communications system (calibrated - in the clear) one-day before you go to the range.
- ☐ Ensure that your ammunition-laden vehicles are properly placard.
- ☐ See **AR 385-63** - **TM 9-1300-206** explosives safety criteria for training operations on firing ranges.
- ☐ Assemble and test space heaters at unit rear. Follow winterized fuel requirements. GP medium tents can be placed on ranges.

☐ Obtain two **1-A:10B:C** (dry chemical) fire extinguishers, water cans and shovels for fire fighting.

**ON DAY OF RANGE** \* If you need to cancel your range please call Range Scheduling Office **791-5005/5008**

☐ On scheduled day the OIC, RSO, and Medic, must sign in at Range Control before occupation of the range.

☐ Establish communications with Range Control:

**42.000 in the clear**

☐ Brief soldiers on range safety procedures, and (Red Box) ammunition amnesty program. Brief road guards.

☐ When you are ready to fire call Range Control and ask for a **"HOT" time.** Ensure red range flag(s) are hoisted and down range [SDZ] is clear before firing.

**DURING FIRING - REQUIRED DA FORM 1594 ENTRIES**

☐ Monitor the radio at all times, make hourly radio checks with Range Control, RTO.

☐ Immediately Notify , RTO of any unusual incidents such as: **(1)** Civilian encroachment on range, **(2)** Accidents, **(3)** Injuries, **(4)** Malfunctioning weapons & munitions, **(5)** Rounds off the range, and **(6)** UXO **(7)** RSO monitors range safety, **(8)** Make DA Form 1594 entries.

**COMPLETION OF FIRING**

☐ Call RTO for **"COLD"** time. Request range clearance instructions. Take down red range flag(s)

☐ Provide this information to RTO: **(1)** number and types of rounds fired, **(2)** Number of Duds or misfires, and **(3)** Number of personnel trained. Don't depart range until properly cleared by Range Control supervisory personnel. Please provide written comments on back of RUDF.

☐ Police all portions of the firing line, gun positions, battle positions, and concurrent training areas.

☐ Please provide Range Control with **written** [positive or negative] comments. Let us know about unsafe conditions or damaged facilities.

## **FORT GORDON RANGE OPERATIONS TELEPHONE NUMBERS**

### **RANGE MANAGEMENT SECTION**

#### **BLDG. #482 RANGE ROAD**

Range Operations Manager, MSG Ramtahal	791-5005
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### **RANGE CONTROL CENTER**

#### **BLDG # 482 RANGE ROAD, FORT GORDON**

Range Operations/ Scheduling, SSG Hill	791-9936
--	----------

Installation Ammo Manager      SGT Vasquez	791-9937
--	----------

Integrated Training Area Management (ITAM), Mr Perkinson	791-5008
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Maintenance NCOIC, SSG Pagan	791-9934
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# RANGE UTILIZATION DATA FORM (RUDF)

## Fort Gordon Range Control

Range 1 - Range 2 - Range 4 Range 5 - Range 6

Range 7 - Range 8 Range 9 Range 10 - Range 11

Range 14 - Range 15 - Range 16

**Demo Pit**

**1** Range Date(s): \_\_\_\_\_ Thru: \_\_\_\_\_  
month / day / 20\_\_ month / day / 20\_\_

Hours scheduled From: 0730 To: 1630 Extension granted ☐ Yes ☐ No

Unit: \_\_\_\_\_

Telephone: \_\_\_\_\_ # Vehicles: \_\_\_\_\_ # Personnel: \_\_\_\_\_

**2** I have **read and understand** the Range Control SOP, and Range Safety requirements pertaining to this range.

OIC: \_\_\_\_\_  
last name / first/ initial / rank Last 4 signature

OIC: Has a signed Risk Assessment in hand: Yes \_\_\_\_\_

Signature

RSO: \_\_\_\_\_  
last name / first / initial / rank Last 4 signature

**3** Circle authorized weapon systems that you will be firing:

### Small Arms Weapons:

9MM - M9 - M16/M4 - M24 - M60 - M240B/G - M249 SAW

BFV (7.62 Coax)- 25mm - M2 50cal

List other weapons here:

**Subcaliber, Inert, TPT :**

MARK-19 (TPT) - M203 (TPT) - AT-4 (9mm subcal) - Mortars (subcal)

TOW (inert)

**High explosives:** (Check with Range Control officer for current restrictions)

MARK-19 (HE) - M18 Claymore (HE) - Hand grenades (HE) - Tow (HE)


AT-4 (HE) - Artillery (HE) - Mortars (HE)

**Demolitions:** Restrictd to no more than (one) 25 lb. charge at a time.

**4 Provide special scenario information:**

 Special fire & maneuver (M31A1 targetry) ☒ YES ☐ NO Approved by: \_\_\_\_\_

 Moving targets ☒ YES ☐ NO Type: \_\_\_\_\_ Approved by: \_\_\_\_\_

 Pyrotechnics / Demo ☒ YES ☐ NO : \_\_\_\_\_ Approved by: \_\_\_\_\_

 Tracer Ammunition Approved ☒ YES ☐ NO Approved by: \_\_\_\_\_

**5 Pre-firing Checklist :**

☐ Commo check (42:000) with RC, RTO ☐ Road guards posted ☐ Down range cleared

☐ TMs & FMs on range ☐ Two [1-A:10B:C] fire extinguishers ☐ Hearing protection ☐ RSO safety briefing provided for soldiers, Line safety NCO's, and Ammo NCO.

☐ Targets aligned according to SOP diagram ☐ Combat lifesaver /MEDIC with up-to-date aid bad, litter, and emergency vehicle on site

**Hot** time: \_\_\_\_\_

**6 Post-firing Checklist ?**

Type and # of rounds fired: 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_

No. # of Personnel fired: \_\_\_\_\_

Were there any misfires on the range ☒ YES ☐ NO

Were there any DUDS on the Range? Was EOD called? \_\_\_\_\_

☐ Target stands removed ☐ Firing points raked ☐ Range policed ☐ Latrine cleaned

☐ Range flag down ☐ End commo with RC, RTO ☐ Cleared by RC, "**Cold**" time: \_\_\_\_\_

**After Action Comments**

**6 Please circle subject matter that you are concerned about. Provide a written commentary of the problem, situation, and incident:**

**Scheduling** - **Condition of range** -



**Comments:** \_\_\_\_\_

\_\_\_\_\_

Attach written commentary of problem areas:

**7 Were there any range safety incidents?:** ☒ **YES** ☐ **NO**

Accident - Injury – Range Cadre issues - Weapons safety - Ammunition malfunctions -  
Targetry malfunctions - Firing positions - Vehicle / driver safety - Brush fires - EOD  
incidents

Other situations or occurrences: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

